THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
CENTERS FOR DISEASE CONTROL AND PREVENTION
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

convenes the

EIGHTEENTH MEETING

ADVISORY BOARD ON

RADIATION AND WORKER HEALTH

VOLUME II

The verbatim transcript of the Meeting of the Advisory Board on Radiation and Worker Health held at The Adams Mark St. Louis, 315 Chestnut Street, St. Louis, Missouri, on October 29, 2003.

C O N T E N T S

October 29, 2003

TRANSCRIPT LEGEND

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P A R T I C I P A N T S

(By Group, in Alphabetical Order)

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AGENDA SPEAKERS

Dr. Jim Neton, NIOSH

Dr. Jim Melius, Workgroup Chair

Mr. Russ Henshaw, NIOSH

STAFF/VENDORS

CORI HOMER, Committee Management Specialist, NIOSH
STEVEN RAY GREEN, Certified Merit Court Reporter

AUDIENCE PARTICIPANTS

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WILLIAM M. BECKNER
DEBORAH BERKEY
DENISE BROCK
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GERI L. DREILING
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DONNA EHLMANN
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CHRIS HADDOX
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SARA SHIPLEY
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DELORES STUCKENSCHNEIDER
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BOB TABOR
BRIAN THOMAS
PAMELA TODOROVICH
RICHARD TOOHEY
DAVID UTTERBACK
JIM WERNER
MARILYN ZIEMER

P R O C E E D I N G S

(8:30 a.m.)

REGISTRATION AND WELCOME

DR. ZIEMER: (Inaudible)... housekeeping, the first item of which will be the minutes that we deferred action on yesterday. So Board members, if you'd please open to that section in your packet -- you're not -- you're not getting any sound?

MR. PRESLEY: There's no sound that's coming out in the room at all.

MS. MUNN: What happened to the folks?

DR. ZIEMER: Sounds like it's working.

DR. MELIUS: It's not feeding in --

DR. ZIEMER: It's not feeding, okay. I think it's simply not feeding to the recorder's -- oh, it is?

MR. ELLIOTT: Now he's got it.

DR. ZIEMER: Testing one, two -- okay, Ray? Okay, thank you.

ADMINISTRATIVE HOUSEKEEPING

DR. ZIEMER: Okay. So I'm calling the meeting back to

order now. We're going to begin with housekeeping and administrative items. I ask the Board members to go to that part of your packet that includes the minutes from our last meeting.

Tony is missing.

MR. ELLIOTT: Tony and Leon.

DR. ZIEMER: I'd like to ask if there are any additions or corrections to the minutes of the August 18th-19th meeting. And here I'm looking for substantive changes. If you have minor, editorial -- spelling or punctuation corrections, you can give us those separately, but substantive changes in the minutes. Are there none?

MS. MUNN: None that I saw.

DR. ZIEMER: There appear to be none. Motion to approve the minutes as distributed?

MR. PRESLEY: So moved.

DR. ZIEMER: So moved. Seconded?

MR. ESPINOSA: Second.

DR. ZIEMER: All in favor, aye?

(Affirmative responses)

DR. ZIEMER: Any opposed?

(No responses)

DR. ZIEMER: Then we'll consider the minutes approved. I do want to tell you that we may go ahead and prepare an abbreviated version of these, but at least content-wise they are approved.

Larry, you had some information -- or Cori has some information concerning Board correspondence, I believe -- are you going to cover that?

MR. ELLIOTT: Well, I'll cover the Board correspondence. Cori has some other items to discuss. And while she's coming to the fore, I'll just touch on this issue.

I believe that some members of the Board are receiving correspondence -- perhaps from claimants, perhaps not from claimants, for -- just letters of interest. And I don't know how you're handling those. I just wanted to make an offer to you that we would be glad to -- to help with the response to those upon your behalf, or help provide -- if -- it depends upon what the inquiry's all about. If it's about status of a particular case, we certainly want to respond to those -- those inquiries and provide status. We do so when

the letters come to us or when the inquiries come directly to us. So we should perhaps talk about how you want to approach this. Certainly it's at your discretion, but we'd like to have a sense of what kind of inquiries you are receiving and if you want us to assist you in preparing responses or handling the response for you and providing a copy back to you as an individual and a copy to the Board, we will do so. But I think -- we feel a need to get a little bit more on top of this.

We had a little discussion about this with a couple of Board members at the August meeting in Cincinnati, and I felt that we needed to bring it up in front of the whole Board. And so I would entertain your thoughts and how you'd like to proceed.

DR. ZIEMER: I know that I've received such letters. I presume others have. They may be a variety of things, people simply inquiring about the program or issues related to the rule making, that sort of thing. As a starting point, I believe it's important that all such letters be answered, that we not ignore them. And you would have to make a judgment, I think, as to whether

it's appropriate for you as the Board member to answer it, or if it's something pertaining to a particular case where you would have to refer it to NIOSH directly.

It seems to me that it would be helpful -- unless there's some obvious reason not to, but normally it would be helpful to make NIOSH staff aware of such inquiries, as well. I know that typically I would copy Larry my response so that he's aware of such interchanges.

Roy, you have a comment?

DR. DEHART: I was one of the ones that brought that discussion up I think in August, and had received a number of letters. And I'm doing exactly what you're suggesting, and that is I do respond to the originator of the letter, but I say in there that the letter is being forwarded to NIOSH for proper response.

DR. ZIEMER: Gen Roessler?

DR. ROESSLER: (Off microphone) I have received a phone call one time (Inaudible) --

UNIDENTIFIED: It's not on.

(Pause)

MR. ELLIOTT: You might want to tap it and see if it's...

DR. ROESSLER: How's that? Now it's on. I was -- I was not there when the phone call came in and then I did receive a FAX from the person. It's a rather long FAX and I haven't even gone through it yet to evaluate it. So my question would be, what would you recommend -- I can see a letter being fairly easy to answer. With regard to a phone call, how -- how would you recommend handling that? I think -- my feeling on this is that -- I don't want to get involved. I want to refer the person to NIOSH because that's where the activity's taking place. But on the other hand, I don't want to be cold and -- and non-responsive because certainly we all share their concerns.

DR. ZIEMER: Let me start with that one because I had such a phone call this past week and it was rather extensive. My -- and sometimes it takes a lot of talking before you figure out exactly whether the person is even possibly eligible for this program or not, and it's not really my determination to make, but you have to hear the people out. And I did -- I did

several things in this case. One was to refer the person to the web site and indicate that there's information there, both about NIOSH and Labor, that will help them determine eligibility. This individual had some issues relating to medical diagnosis and, you know, I had to assure him that I was not a medical doctor nor could I diagnose things by telephone. But in any event, providing information about the program, referring to the web site is helpful, I think. I also told this individual that he needs to be in contact with the Labor Department folks and they can determine, from where he worked and the years and those things, his eligibility for the program, as well. But I think we can mainly refer people.

As you say, it's difficult on -- I think on the phone, partially because these things tend to ramble, and you get into all kinds of information that may or may not be pertinent. It's hard to cull it out sometimes. But I think there's no easy answer to any of that. It's -- you sort of -- it's a judgment call. But I think -- I think the most important thing is probably referring them to the right people where they can get the

information, and that's got to be Labor or NIOSH, basically, I would say.

MS. MUNN: I suppose I've been very fortunate. I haven't received any written correspondence, but I frequently receive verbal inquiries and telephone calls about the program. And I make it a point to, first and foremost, point out to them that I am a member of the policy group which is overseeing the process, that I don't have anything to do with their claim, because I think it's important for people to understand that they are not talking to someone who can exert influence on their behalf with respect to their claim.

My experience has been like yours, Paul, that most people want to tell you something about what they think their situation is. But I -- I always make a point to emphasize what our function is, and that we're -- it's our job to see that the process meets the law and is handled in a legitimate manner, and that it's the responsibility of the Department of Labor to show them what must be done, what steps they must go through. I also assure them that it's a lengthy process and point out that I'm sure they want it to be done

correctly, and so therefore time is one of the things that they must expect, and give them the correct contact information. That, so far, has worked well for me.

MR. ELLIOTT: I would add to that -- I think that's an excellent approach, and it goes back to what -- if you recall the advice you were given from counsel about acting as an individual member, not on behalf of the Board, when you interact with people.

I think -- we certainly want to help you. I understand your interest to respond to these people, to the claimants, to the people who provide inquiries to you. And we don't want to stifle that. I would add this, also, that in some cases, if the claimant -- if it is a claimant and they want to provide information to you, or even the letter that they may send to you, may be appropriate for addition to their administrative record. And so that's another reason why we would like to capture these and add them to the administrative records so that it is complete.

So again, we stand ready to help in any way you would like for us to assist. We can prepare the response,

give it back to you and you can send it out, or we can send it out -- prepare a response, send it out and copy you. So any way an individual member would like us to work with you, we will.

DR. ZIEMER: Okay. Any further comments on this issue?

(No responses)

DR. ZIEMER: It appears not. Larry, final comment?

MR. ELLIOTT: You can -- if you have a phone call that you would like for us to interact with the caller on, you can send it to me, call it to my attention, or you can call it to Chris Ellison's attention or Dave Sundin's -- any of the three of us at any point in time should be available to you. And so if I'm not there, you know, you could tap Dave Sundin or you could tap Chris Ellison.

DR. ZIEMER: Thank you. That's very helpful and I think -- even if your response is simply to tell the person that you are forwarding their information and let them know that they're at least being -- the issue's being addressed for them.

Cori, you have some additional housekeeping things for us?

MS. HOMER: It appears as though we have our microphone problems worked out. Good morning.

Just wanted to let you know that tomorrow I'll need your e-mails listing your time. Go ahead and send those to Larry, cc'ing me. I'll want that broken out by work group time -- whatever work groups that you spent time on -- separate from your Board time and your prep time.

Also wanted to remind you on the record that -- not to make your own flight arrangements, if at all possible. We can't guarantee that you'll be reimbursed. And that when on government travel, which you are on government travel when you're attending a Board meeting, that we really need to do your travel orders.

And one last thing that I can think of is -- every year this time of year we file an annual report to GSA. That covers the activities and the accomplishments of the Board on an annual basis, and it should be final and published by sometime mid to late November, maybe early December. If you're interested in a copy of that, I can certainly provide that.

Any questions?

DR. ZIEMER: Cori, is that annual report a fairly extensive or a brief -- you know, a couple of pager or what does it look like?

MS. HOMER: It's approximately four pages, five pages. This year there were some additional requirements, so I can't say for sure what format that's going to take, but it's -- includes just generally the financial information and -- and what the activities of the Board were for the year.

DR. ZIEMER: And you would have it in electronic form, as well, I presume -- or would you?

MS. HOMER: I'm not entirely certain if I'll be able to access it on the web and can provide you with that web site, or if I'll have to send you a hard copy. It depends on what committee management allows me to have.

DR. ZIEMER: Uh-huh. Maybe I'll just take a moment and ask the Board members if they are interested in copies. Is there anyone -- would everyone like a copy? This might be an easy way to do it, let's just -- probably. Why don't we just plan to make --

MS. HOMER: All right, as soon as it's --

DR. ZIEMER: -- make them available. If they can be

made available electronically, I suppose that's the quickest and easiest way to do it.

MS. HOMER: Okay.

DR. ZIEMER: Otherwise, hard copy. Okay, thank you.

MS. HOMER: Okay.

DR. ZIEMER: Any other items for the --

UNIDENTIFIED: Talk about next meeting at this point.

DR. ZIEMER: Yeah.

MS. HOMER: Next meeting?

DR. ZIEMER: Let's go ahead and talk about next meeting. I think the date and place is set, so we can --

MS. HOMER: Okay, we're in Las Vegas --

DR. ZIEMER: -- let you give us the information.

MS. HOMER: -- tentatively, December 9th and 10th. I have a tentative contract with the Westin, which is a brand new property in Las Vegas. They're not even open yet. We might be their very first meeting. As far as I know, that's -- that could very well be the case. We'll be about a quarter-mile off the Strip, so if you'd care to gamble or see the sights, we won't be far from -- from the Strip at all and -- and I understand

that Bob is seeing if he can work up a visit for us.

DR. ZIEMER: Bob, you may want to mention what you're looking at in terms of a visit to the Test Site, which is really one of the reasons for going to Las Vegas.

MR. PRESLEY: If we can set it up, the tour will be probably on Thursday. It will be all day long. It's an hour and a half to the Test Site from Vegas, an hour and a half back, put you four or five hours out on the Test Site, so it's an extra day, any way you do it. What I'm going to do is set it up for staff personnel and the Board, and if we have any spouses, I will at this time ask if we can take spouses with us, so we'll -- we'll put that in and I'll talk to Mr. Flanagan next week and see what we can do.

MS. HOMER: Okay.

MR. PRESLEY: And then I'll send everybody an e-mail and we'll let you know.

MS. HOMER: All right.

MR. PRESLEY: How many people are interested in going, staffers that are here?

DR. ZIEMER: This is NIOSH staff first, right? You're looking at NIOSH staff -- or Labor staff, too?

MR. ELLIOTT: Yeah.

DR. ZIEMER: Yeah, any government staff people.

MR. PRESLEY: And then the Board. Okay?

DR. ZIEMER: How many on the Board?

MR. PRESLEY: Okay, so we're talking 25 to 30 people. That'll be -- see what they've got -- a bus available.

DR. ZIEMER: And if it's -- if we're able to set it up, details will be mailed and we'll get -- get a point where you will confirm your participation, as well as a spouse, if --

MR. PRESLEY: Correct.

MS. HOMER: If you'd like, Bob, I can go ahead and clear those names for you, collect them, put them on a listing. And that will also help me with the rooming list.

MR. PRESLEY: Uh-huh, okay.

MS. HOMER: Okay? Anything else?

MR. PRESLEY: What we'll do is we'll need names and Socials.

MS. HOMER: Okay.

MR. PRESLEY: And I'll get back with you the first of next week.

MS. HOMER: All right. So if your spouse is interested, if you could provide me with their Social Security number, that would be helpful.

MR. ELLIOTT: I would also like to know if there are any agenda items that you want me to address for the December meeting. Certainly we'll have -- have a face-to-face with your contractor. There'll be the portion to negotiate -- or to deal with the task orders in that piece, but other agenda items that you want me to explore to add.

DR. ZIEMER: One thing on the face-to-face with the contractor, unless something has changed since yesterday, I understand that we can't mandate that the contractor be there since the contractor doesn't have a task order yet and money to support travel, so the face-to-face could conceivably be a phone-to-phone or --

MR. ELLIOTT: We'll -- we're going to have to look into this and how we can make this a face-to-face, yeah.

DR. MELIUS: (Off microphone) Just -- one more --

MR. ELLIOTT: We may have to put -- we may have to put one task in front of them just to get this --

DR. ZIEMER: Travel task for --

MR. ELLIOTT: Travel task, so we'll do that for you.

DR. MELIUS: (Off microphone) For the agenda, we'll have a follow-up -- I mean I'll talk about a little bit -- but a follow-up with the interview work group, so we'll need some time.

DR. ZIEMER: So the meeting with the contractor, the face-to-- or the follow-up interview work group, two items right at the start. Mark?

MR. GRIFFON: This is a little bit of a follow-up from yesterday, but I'm wondering if it would be useful to the Board to have some sort of presentation on IMBA or -- or -- you know, at some point I think a training and -- well, we haven't even received the software. I have a earlier copy, but I don't think anyone else has -- has seen it or used it, so I think at some point --

DR. ZIEMER: Can that be done there?

MR. ELLIOTT: We'll look into that.

DR. ZIEMER: Look into that. And other items, if there's something that occurs to you between now and -- I'm not sure when, the next month, actually, we'll probably be working on this agenda and so it's always

somewhat in a state of flux, almost up to the last week, as things are added or dropped. But if you have some particular thing you think should be on the agenda, let Larry know or let me know, 'cause we'll be --

MR. ELLIOTT: We'll probably try to get the *Federal Register* notice out by November 15th, and with that we'll have to have a draft agenda. That agenda tends to change, of course, but we'd like to have it as firm as possible.

DR. ZIEMER: But we have several -- several weeks --

MR. ELLIOTT: You have several weeks.

DR. ZIEMER: -- lead time on that. Okay. Any other housekeeping items we need to address right now?

MR. ELLIOTT: I have one more. I just want to announce that we try to bring the best possible people to bear on the work that you have, and I think it's appropriate to let you know that the recorder/transcriptionist that you have today working with you is the second-time National Champion court recorder.

(Applause)

MR. ELLIOTT: I'm further told that if he wins again

next year, he will be Grand National Champion, and there are only two others in the -- I guess the world like that. So --

DR. ZIEMER: Maybe the universe.

MR. ELLIOTT: So congratulations, Ray.

(Applause)

DR. ZIEMER: Indeed, we congratulate you, Ray. That's great. Nothing but the best. Right?

MS. MUNN: Absolutely.

DR. ZIEMER: I believe that concludes our administrative items for this morning. We're ready to proceed on the agenda. Oh, I'm sorry, Wanda. You have an item.

MS. MUNN: Are we not going to make any -- are we not going to have any discussion about meetings following the Las Vegas one? I -- there's some concern in my mind --

DR. ZIEMER: Yes, we can -- we could do that now. Perhaps -- yes, we'll do it now.

MR. ELLIOTT: You have a calendar that was provided I think that goes through -- January, 2004 through December, and I'm sure Cori's going to ask you to

provide that, but if you pull that out now, maybe we can get those marked up.

MS. HOMER: (Off microphone) Would you like to start with the location of our next meeting?

MR. ELLIOTT: You want to start with location, Cori's asking, or do you want to start with dates?

DR. ZIEMER: Let's start with dates, see when -- when people are available.

If we -- we'll be meeting December 9th and 10th. It's unlikely we would need to meet before the first of February. Whether -- and when we meet next may also depend somewhat on what we decide to do on the issue of a subcommittee, as well. But let us proceed as if we're going to meet and get some times blocked out. That's usually easier to do that now and -- and delete them later, if we need to, rather than try to add them after people's schedules fill up.

Does anybody believe that we would need to meet earlier than February 1st?

MR. GRIFFON: Yeah, I think early -- early February would probably be good -- early to mid-February would probably be good, assuming in December we approve the

tasks. I think there's a couple of deliverables in the task that are fairly fast turn-around on the methods that they'll use and things like that, so we want to be able to meet quickly and review that and get them going on the actual work.

DR. ZIEMER: All right. Gen?

DR. ROESSLER: The week of February 8th is the Health Physics Society mid-year meeting. I would assume that --

DR. ZIEMER: That's in Augusta.

DR. ROESSLER: -- would involve quite a few people.

MR. ELLIOTT: Where's that?

DR. ZIEMER: Augusta, Georgia.

DR. ROESSLER: Augusta.

MR. ELLIOTT: Yeah, but what dates?

DR. ZIEMER: 8th through 11th.

MR. ESPINOSA: Augusta sounds good to me.

DR. ZIEMER: That's true, it is in the vicinity of the Savannah River Plant, so that if someone -- if we did that, the meeting would almost have to be on the 12th and 13th, as far as participation of some of the Board members who are active in that group, and some of the

staff, as well.

DR. ROESSLER: Yeah, I'm committed on the 12th, the day after the meeting.

DR. ZIEMER: You have a conflict.

DR. ROESSLER: On the 12th.

MS. MUNN: I would think 13th and 14th.

DR. ZIEMER: That takes you into a Saturday.

MS. MUNN: I'm looking at the wrong month.

MR. ELLIOTT: We can do that. If you want to meet on a Saturday, we can do that. My staff is going to kill me, but we can do that.

DR. ZIEMER: Larry says that it's doable. Wanda, you have another comment on that?

MS. MUNN: No --

DR. ZIEMER: You have your flag up.

MS. MUNN: -- the first week is problematical for me, but --

DR. ZIEMER: Is the Board interested in meeting in Augusta on that date? Shall we block that out?

MR. ELLIOTT: The 13th and the 14th?

DR. ZIEMER: Uh-huh. Gen, are you out of the loop all day on the 12th?

DR. ROESSLER: I think so.

DR. ZIEMER: The concern I have there is that those who are attending the meeting 8th to 11th, both staff and -- and Board, then are cooling their heels for a day in between.

DR. ROESSLER: We're having a Health Physics Society editor's meeting and I really need to be at that.

DR. ZIEMER: Yeah.

MS. MUNN: Perhaps we could set up a tour of the site that day.

DR. MELIUS: What about the week before?

DR. ROESSLER: That's a good plan.

MS. MUNN: That's good.

MR. ELLIOTT: The 5th and the 6th?

DR. ZIEMER: The 5th and the 6th, and then stay over. That would be all right.

DR. MELIUS: And people that want to stay over can stay over.

DR. ZIEMER: Uh-huh, 'cause I think the meeting actually typically kicks off on a Sunday, doesn't it -- Sunday afternoon or evening?

DR. ROESSLER: For some people, officers and so on, it

might involve Saturday. I think Dr. Toohey is an officer, so he might be involved on Saturday.

DR. ZIEMER: Yes, but our -- but our meeting -- I know it's important for Rich to be here, but since he's not a Board member, we can't -- we can't use his calendar as...

MS. MUNN: I'm committed 2nd, 3rd and 4th. I can't travel till the 5th, but I guess I could travel --

DR. ZIEMER: The 5th and 6th would work?

MS. MUNN: The 5th and 6th would work, probably. I'll just leave early.

DR. ZIEMER: Is the 5th and 6th okay?

MR. ELLIOTT: The 5th and 6th would probably work best for staff and my wife. Since the 14th is Valentine's Day, I'm going to get beat up two different ways, one from staff and one from home.

DR. ZIEMER: Good point.

MR. ELLIOTT: But 5th and 6th would be probably the ideal for us, but we'll do whatever you want.

DR. ZIEMER: Let's set aside the 5th and the 6th.

MS. HOMER: Any other dates?

DR. ZIEMER: Augusta.

MS. HOMER: Any other dates besides the 5th and 6th during the month of February? Any other locations, possibly?

DR. ZIEMER: For February? You mean as a fall-back?

MS. HOMER: As a fall-back.

MR. ESPINOSA: D.C.?

MS. MUNN: D.C. will always work for me.

MS. HOMER: The week of the 16th, possibly?

MR. ELLIOTT: No.

MS. HOMER: No?

MR. ELLIOTT: Can't do that.

MS. HOMER: Week of the 23rd, no?

MR. ELLIOTT: Pardon me?

MS. HOMER: Week of the 23rd.

MS. MUNN: That'll work for me.

DR. ZIEMER: Who has conflicts the week of the 23rd?

DR. MELIUS: I have them the beginning of the week, but Thursday and Friday, 26th and 27th, I'm okay on.

MR. PRESLEY: If we start slipping out that far, we're getting into conflict on our contract -- our deliverables.

MS. HOMER: Okay. The 5th and 6th in Augusta?

MR. PRESLEY: Last week in January would be better, I think.

DR. ZIEMER: Let's just stick with 5th and 6th and see --

MS. HOMER: Okay.

DR. ZIEMER: -- see how we can do. Then we would probably be looking at April. April -- late April, early May? Let's --

MR. ELLIOTT: Not the 15th -- or the --

DR. ZIEMER: Not the 15th of April?

MR. ELLIOTT: Not the 5th through the 16th -- 5th through the 16th is out.

MS. MUNN: And then the following week, the 19th, would be fun here.

DR. ZIEMER: The week of April 19th, how does that look? Any -- any conflicts?

(No responses)

DR. ZIEMER: Okay. Why don't we tentatively block off 20, 21 and 22, to give Cori a little flexibility.

MS. HOMER: Okay.

DR. ZIEMER: And let's talk about location.

MS. MUNN: If you want to come out to Hanford, that's a

good time of year to do it.

DR. ROESSLER: Yeah, sounds good. Can you give a tour?

MS. MUNN: Oh, yeah. Oh, yeah.

DR. ZIEMER: In fact, that would be a good reason to stay the extra day. Plus you need a couple days to get there and a couple days to get back.

MS. MUNN: You need a day to get there, you need a day to get back, uh-huh.

DR. ZIEMER: Well, we're sort of overdue on visiting the Hanford area and -- and interacting with the folks there. Shall we try for Hanford in late April?

MS. MUNN: Fine.

DR. ZIEMER: Okay. Now it occurs to me -- so -- so we're sort of -- have the next three meetings lined up here. We also need to gain the experience with our contractor and -- and see where we're going on the subcommittee. I'm wondering if it would be -- whether there would be any need to go beyond April for the moment.

MR. PRESLEY: It'd be nice to go ahead and book a week.

DR. MELIUS: I really -- like we talked about yesterday, I think it would be helpful if we -- the

next meeting we talk about the subcommittee issue, figure that out in terms of a schedule of how we interact and what's the most efficient --

DR. ZIEMER: Right.

DR. MELIUS: -- way of doing that. Then I think we could block out some more meetings and --

DR. ZIEMER: Yeah.

DR. MELIUS: -- get a better sense of what the schedule would be. 'Cause it may very well be that quarterly meetings --

DR. ZIEMER: Well, basically this takes care of the next six months, for all practical purposes, as far as having time slots available 'cause it takes us into May.

Okay. Agreed?

DR. MELIUS: I just have one other -- Cori, can you just make sure Henry Anderson --

MS. HOMER: Absolutely.

DR. MELIUS: -- hears about these dates 'cause --

MS. HOMER: Yes, I will.

DR. ZIEMER: Okay. Thank you very much. Let us proceed now to the next topic, which is --

MR. GRIFFON: Paul --

DR. ZIEMER: -- an update on the site profiles. Yes, Mark?

MR. GRIFFON: Just one more thing. I'm not sure if this is housekeeping or what, but our next meeting -- I'm interested in the tour of the Test Site, even though I've had some -- I'm just wondering if -- if that's going to give us enough time to review these tasks -- the task reviews may be fairly straightforward and, you know -- but do we have enough time on the agenda --

MR. ELLIOTT: Two days.

MR. GRIFFON: -- with that tour --

DR. ZIEMER: We have two days, and that's going to be --

MR. GRIFFON: But the tour's a half a day or is it --

DR. ZIEMER: -- kind of our main focus. We will -- we will make enough time on the agenda for that.

MR. ELLIOTT: I think Bob's proposing the tour -- you need a full day for the tour --

MR. GRIFFON: Oh, okay.

MR. ELLIOTT: -- so that was the --

DR. ZIEMER: We have two days, plus the tour.

MR. GRIFFON: Oh, sorry.

MR. ELLIOTT: So the 11th, I think --

DR. ZIEMER: Right.

MR. ELLIOTT: We're there the 9th and 10th, and then the 11th would be the tour day.

DR. ZIEMER: Yeah, we're not taking one of the Board days for the tour. The tour's extra.

MR. GRIFFON: Thank you.

SITE PROFILE UPDATES

DR. ZIEMER: Right. Okay, thanks. So let's call on Jim Neton now for the profile -- site profile update.

DR. NETON: Well, good morning. It's a pleasure for me to get up here this morning and address an area that we've invested, along with our ORAU contractor, a significant amount of resources over the last three or four months, and that is the site profiles for the individual sites so that we could proceed with the dose reconstructions as expeditiously as possible.

I'm going to give a few slides -- a brief overview of where we are with this, and then I'd like to spend the bulk of my time going over the Mallinckrodt Chemical

Works site profile that was just completed this Friday. Just as a reminder, I think I showed this slide last time, but you know, site profiles support dose reconstruction. These are limited scope documents, they are specific for a site -- or even a facility at a site -- and they are used by dose reconstructors as a road map to figure out, in conjunction with the other available data for a claimant, such as the claimant interview information that may have been provided in the claimant's submission or the Department of Energy individual dose records that may have been provided, either by the Department of Energy or obtained through site data captures -- to put all those pieces together and to make some sense of what they're looking at when it comes time to estimate the exposures to the workers during their career.

They are site-specific. It gets -- they involve characterization of monitoring programs, chemical forms, processes, all the things that you might need -- all the things that might end up affecting the dose reconstruction. But they're really good in the sense that they help minimize interpretation. And as you

know, we have about 130 health physicists slated to work on these dose reconstructions, so we really need to have some consistency among them, and this helps bring that to the dose reconstruction.

Again, it's basically used as a handbook, and I would point out these are dynamic documents. They're not static. As soon as a revision's out there, we try to put it on our web site as soon as possible. We accept comments and any comments or information that we receive after that, we are committing to updating the Technical Basis Document or site profile and going back in time and evaluating what effect those changes may have had on dose reconstructions that were done prior to the new information being available.

A little general background information that's transpired since the last time we met. All completed profiles can be avail-- are viewed at our web site, cdc.gov\niosh\ocas, and as we discussed yesterday, comments are encouraged and can be made to the NIOSH docket office. If you look under the site profile itself, at the very top of the introduction to the site profile, there is a docket address that you can mail

to, and that information will be considered by us, as well as posted on our web site to be viewed by anyone who visits the site.

We also are in the process of arranging briefings with union members, representatives at each of the sites, as available, to solicit input. We mentioned yesterday that we are scheduled to visit Savannah River on November 11th to provide the -- it's now at Rev 1 of the Savannah River Technical Basis Document or site profile, and we are currently in the process of making arrangements to visit Hanford. Just recently we've completed all six pieces of the Hanford Technical Basis Document -- or the six Technical Basis Documents that make up the site profile, so we're looking forward to going out there and presenting that in the Richland area.

The team members who are on the individual site profiles are now on the ORAU web site, so if one goes to oraucoc.org -- that's Oak Ridge Associated Universities, Cincinnati Operations Center.org, there is a bar now you can click on that says site profiles, and all the team members that make up each site profile

team are listed there, along with their associated conflict of interest statements. That is an addition since the last time we met.

Okay. Where are we right now? We have 15 DOE facilities being worked on in parallel, so I think the number right now is somewhere around 50 or 60 health physicists and associated staff actively going out and pulling data together to write these documents. Each of these documents alone typically runs around 100 to 150 pages.

We have a target date of the completion for these DOE facilities by the end of the calendar year. Although, as I mentioned yesterday, if there are circumstances beyond our control, they may slip some. But we are committed to trying to keep as close to that schedule as possible.

When those 15 documents are completed, we estimate that they will address about 77 percent of the claims currently in our possession. So at that point we will have a road map to at least begin reconstructing the doses for the vast majority of the claimants that we have in-house today.

There's some new documents coming out that I'll probably like to discuss at future meetings, but these are complex-wide documents being developed for DOE and AWE facilities. These are Technical Basis Documents that address, on a broad scale, dose reconstructions for certain classes of workers at DOE facilities, those who may have never been monitored and whose monitoring records have no -- no results. We find that we can group these together and use some characteristic assumptions, over-estimating in certain areas, to try to evaluation (sic) as quickly as possible. It's really an efficiency process measure that we've adopted.

Likewise for AWE facilities, many of these facilities were uranium facilities -- almost all of them -- so they have a lot of characteristics in common. So we would just take a uranium facility Technical Basis Document that already exists and -- and update it with a technical annex or a bulletin to address issues that are unique just to that facility.

There are a number of TBDs completed thus far. I think you've -- I think we discussed yesterday that Bethlehem

Steel, Blockson Chemical, Mallinckrodt Chemical Works and Savannah River are already on our web site. The total documents are out there. Hanford has just been completed. We are assembling the six pieces -- the Technical Basis Documents that make the profile -- that constitute the profile, and we'll have those on our web site as soon as we get those in one concatenated version with an official signed page. We expect to have that next week sometime.

There are a few other pieces. As we develop the individual chapters of the site profile, we also approve them. But until we get the complete document and assemble it, we're not posting it on our web site at this time.

Okay. I'd like to spend, as I mentioned, the majority of my time talking about the site profile for Mallinckrodt. And I'd like to acknowledge at the outset that Oak Ridge Associated Universities put this together, principally Janet Westbrook was the site expert on this document, with assistance from Jerry Anderson and I'm sure a cast of others doing data capture efforts and reviews. I would say that although

ORAU put this together and authored it, this was -- this document was reviewed in parallel with NIOSH staff, so we take complete responsibility for the content of this document. And once the document is issued, it is approved by NIOSH for use, not until that time.

As I mentioned, this document was just completed Friday. We're doing our best to aggressively get these things out as quickly as possible. And I think that the document was posted on our web site within several hours after I signed the final document. So we're committed to getting things out there in the public for review as soon as possible.

The document is a 128-page document -- sorry, Dr. --

DR. ZIEMER: Let me interrupt here. Mike, you have a question here at this point? Yeah.

MR. GIBSON: The health physicists and those that are doing the site profiles, how many of them are Q-cleared and are they going through classified documents? And if so, how do you take that relevant data and get it into the Tech Basis -- or the site profile?

DR. NETON: (Off microphone) Good question. We do

have a number of Q-cleared health physicists both on the ORAU staff and the NIOSH staff (Inaudible) --

DR. ZIEMER: I think your mike may be slipping there, Jim. Can you hook it up there maybe a little closer to your neck region?

DR. NETON: Is that better? We have a number of Q-cleared individuals both on the NIOSH staff and the ORAU staff. I think right now NIOSH has, out of our ten health physicists, three -- three folks that have Q clearances, plus we have ability within NIOSH to draw from other Q-cleared individuals. And I might have to defer to ORAU on the number of currently Q-cleared people. I think it's on the order of 15, 20. It's a fairly large number. We are actively working on getting those -- some of those clearances transferred over to work on our project. As some of you may know, an active Q clearance for a Department of Energy facility is just that, it's for a specific function, and we need to get those cleared, and we work very closely with Office of Worker Advocacy in DOE to effect those transfers.

That was the first question. The second part was --

oh, how do we address Q-cleared data if we run into it. Thus far, we have not had any data that we looked at that has -- well, we've had data that has not been classified, so we've had to have Q-cleared folks go into these rooms and look through the data and see if any of that information may be applicable to the site profiles. We've done that. We've gone in and looked through storage vaults, and thus far we've not found information that was of a classified nature that needed to be included in the dose reconstruction.

There is another issue, though, with UCNI data. UCNI data is not classified, but it is essentially considered sensitive and sort of on a need-to-know basis, almost -- similar to Privacy Act type data, so you don't put it out there unless it's -- it's there. At one of the facilities we're actually going through an UCNI review to make sure that we can put it out there on our web site. We can have it in the Technical Basis Document and use it, but there's a question of whether or not we could post all that information on our web site, for instance. And right now we're going through that process. So far we have not held up

anything.

Larry, did --

MR. ELLIOTT: Could -- you need to specify UCNI for the general audience.

DR. NETON: Yeah, I was going to, but I can never remember the darned acronym. It's Un--

MR. ELLIOTT: Bob Presley can help us, I'm sure.

DR. NETON: Yeah, Bob, UCNI, un--

MR. PRESLEY: Just a minute --

DR. NETON: --classified nuclear information, or something like that?

MR. PRESLEY: -- I'm going to give you the official thing right here.

DR. NETON: Okay. I didn't want to mis-speak, so I was trying to skirt the issue.

MR. PRESLEY: Let me get the right one here. Unclassified Controlled Nuclear Information.

DR. NETON: Right. Thank you, Bob. I always forget the Controlled.

MR. ELLIOTT: I would also add that as we're going through the vaults and the secured areas -- at Y-12 we're having a little bit of difficulty getting

information that we think is necessary. We're working with classification officers. In the research program we have established a procedure where we work with the classification officers and come up with data or information that is couched in a way that we can use it and it's not classified. We've had success in that regard and we're using that same approach in this case where we can. If we come against a wall where we cannot successfully get the information in a declassified form, that's going to present a dilemma to us and we'll have to cross that bridge when we come to it. But thus far, we've been successful in working this through this way -- in a way that we can use the information that doesn't present a security risk.

DR. ZIEMER: Jim Melius?

DR. MELIUS: Just a long -- just to follow up on that, I think it would -- at the very least, if you do run into that situation, there ought to be some way of informing people within the document or --

DR. NETON: Oh, absolutely.

MR. ELLIOTT: Absolutely.

DR. MELIUS: -- whatever so -- so that that's -- so

that you don't end up with a situation where you're relying on data that's not available, nobody knows that, and --

MR. ELLIOTT: Absolutely, and we will do that. And in fact, if we come to that point and we have to have the information for a case -- to finally adjudicate a case or in an appeal situation, we will work with -- I believe the Department of Justice has experience in this, and the Department of Energy, and we'll work with them in order to make sure that the information is used in the adjudication of the case. But it'll be done in a way that it protects the National security interests.

DR. ZIEMER: Mike, has your question been answered? Yeah. Thank you.

DR. NETON: Thanks, Larry. I'd just add that I think we have a fairly good working relationship with the classification and security people at this point and it's working -- well, it's working fairly well for us. Okay. The site profile for Mallinckrodt is typical in length of a site profile. It's 128 pages long. That includes 40 pages of tables, though. There are extensive tables in this document that contain results

of air sampling measurements, bioassay measurements, radon measurements -- all the kinds of nuts and bolts information you think you would get in a typical site profile. It has 150 different references. Forty of these references are from the former Manhattan Engineering District/Atomic Energy Commission. As you'd expect, they had a very active involvement in the Mallinckrodt facility, conducting a lot of health physics monitoring type programs. As many of you know, the former Health and Safety Laboratory within the AEC was very active and involved, was sort of serving as the corporate health physicists, if you will, of these facilities that did not have in-house practical experience handling radioactive materials.

The contents of the document are outlined in -- I have seven chapters listed here. There's actually eight. The bottom chapter on residual contamination is currently marked reserved, and I'll talk about that in a little while. But as -- you can see them outlined here, and what I'd like to do from this point forward is actually briefly discuss what -- as best I can in the time allotted; I mean we could probably spend most

of the day talking about this -- what's addressed in each of these individual chapters.

The purpose of course is to assist the reconstruction of radiation doses to workers at the Mallinckrodt facility. And I should emphasize that this is the downtown St. Louis facility only. It does not address the St. Louis Airport Storage Site, it does not address the Hematite facility that was operated by United Nuclear Corporation. So it's really just the collection of buildings, the 60 or so buildings that were used at one time in the Destrehan and Broadway Street complex.

The major plants addressed, although there are other buildings -- ancillary buildings -- are Plants 1, 2, 4, 6, 6E, 7 and 7E. These were the main production plants that were in existence to essentially make uranium ore. The Mallinckrodt facility was a chemical facility that the DOE -- well, not the DOE, but the Manhattan Engineering District converted into a uranium refinery -- is the best way to describe it. The history of the site runs from April, 1942 through July of 1958.

As I mentioned, there was also residual contamination

that we are obligated to include in a worker's dose reconstruction, and that would run from the period of 1959 through 1995 when the buildings were officially decontaminated and I think they were torn down in 1996 or 7, I forget, but we believe the relevant period to complete the residual contamination is through 1995. That section is listed as reserved, if you go on our web site, which just means that, you know, we're not quite there yet. We have a draft chapter, but we're still going through and formally reviewing it and making sure that it makes sense. It's based on this -- some of you health physicists may know, the ResRad model, the residual radioactivity model, and we're fine-tuning the calculations. And as soon as that's available, we'll get it out there.

Okay. The introduction chapter is what you think it does. It goes through and talks about what happened there. As I mentioned, Mallinckrodt (sic) Engineering District asked Mallinckrodt in '42 to start making uranium for the weapons effort. So they took a chemical factory and started making uranium. And it's amazing to me that in April of '42 they started to

research how they could make this, and by July, just about three months later, almost a ton of uranium -- uranium dioxide was being produced per day. That's a pretty massive increase. The facility started off with about 25 workers working on this production. It ultimately ballooned to I think about 1,500 or thereabouts.

I'll get into this a little bit later, but they started producing uranium trioxide, uranium dioxide, and then they ended up going to UF4. These are all intermediate steps along the way to making uranium metal. You start with uranium ore, and eventually you want to get metal, and so all these chemical compounds are just intermediate products on the way to making the desired product, which is the metal.

In 1953 the first full uranium plant was started, although uranium metal was made before that, but here -- here we had a plant that was officially constructed solely for the purpose of making uranium metal.

So through the history of the site it's estimated about 50,000 tons of natural uranium products were produced at this facility. So it was a pretty large-scale

operation, very early. This essentially set the stage for the production of uranium at most facilities in the country. I mean this was really the place where the process was developed.

Full scale health physics programs, though, didn't start at this facility till 1947, so we have a period of time from '42 to '47 where we have very sketchy monitoring data. That does present a bit of a problem, but hopefully I can discuss as we go the methods that we use to infer doses that are missing. After all, that is the purpose of dose reconstruction is to try to reconstruct exposures that were either monitored inadequately or not at all.

Film badging, radiation exposure badges on the workers, were begun in late 1945, with a urine sampling program to measure how much uranium was inhaled by the workers later on in that decade. Both Mallinckrodt and the Atomic Energy Commission performed periodic air sample and surveys at these facilities, which included the air sampling, radon breath analysis, uranium in urine, primarily.

The Mallinckrodt numbers are sparser. There are fewer

numbers than the AEC numbers, and in addition, the Atomic Energy Commission -- as I mentioned, the Health and Safety Laboratory numbers tend to be much better documented. They worked with standard operating procedures. They tended to be preserved better. In general, I would also say that the health and safety or AEC numbers are larger, are higher in value than the Mallinckrodt workers. Because they were better documented and they tended to be claimant-favorable, more reliance is placed in this document on the AEC numbers.

As I mentioned, external dose records -- external dosimetry was started in about '46, missing from '42 to '45. We have pretty good external dose records after that. I believe we have somewhere in the vicinity of approaching 20,000 film badge measurements at this facility.

The internal dose records are mostly available from '48 on, and are missing from '42 to '47. So the large problem with Mallinckrodt is this very early time period, and particularly when it was fairly -- I would characterize it as a somewhat dirty operation. I mean

their controls were -- were really not there in the very early days, although we do know what the processes were. I mean they were not that different than what happened later on.

So the purpose of the document is to provide a context for interpretation of these existing records, all these film badge and urine sample records, which I think we have 40,000 urine sample records available and about 2,500 to 2,600 individual radon area measurements. So it provides a context for interpreting the records, along with how do we determine missed dose for periods when records just don't exist.

The chapter on history of site use summarizes the chronology of the use of the site. It characterizes the approximately 60 buildings that were used at the site, mostly -- it lists the building and there's some annotation of what process was done in those buildings over what time periods, a brief description of the work performed. Also it does a characterization of the expansion of the facilities. The original two buildings, Plant 1 and 2, were existing facilities that were converted to operations, and as they added

facilities to expand, that's characterized in this document.

There is a section on decontamination surveys. Periodically during the operation, decontamination was performed, starting as early as 1948 and '50. Although, as you can imagine, the decontamination was not done to current modern standards. The levels were still fairly high, and these buildings at that point were left for unrestricted use, even though by today's standards they'd probably be controlled areas in the modern protection programs. So I mentioned the facility decontamination started in '48 and '50, but they were further decontaminated in 1954 and '70 for unrestricted use. The final decontamination took place in the 1990s and the buildings were demolished in 1997.

Recycling was performed -- of uranium -- starting around 1957. And I just want to point out that when I talk about recycling, I'm really talking about just taking scrap materials -- they would take billets and crop them, cut them off. The sawdust, the saw shavings. Uranium was a very valuable commodity back then and they didn't just want to throw it in the

trash, so they would take uranium scrap, redigest it in nitric acid and run it through to recover it because it was such a valuable commodity. We can find no evidence at Mallinckrodt that recycled uranium was run through this facility. We've looked fairly -- on a fairly detailed basis, and to our knowledge, the so-called recycled uranium that was run through a reactor, that contained transuranic material, does not appear to have been moved through the Mallinckrodt facility. That is true of the Weldon Springs facility, which we'll address in a later Technical Basis Document. But as far as we can tell, there were no plutonium residues run through Mallinckrodt.

The waste residues were taken to, as I mentioned previously, the St. Louis Airport Storage Site, known as SLAP or SLAPS. These were the filter cakes, that sort of thing. When they filtered the residues after the extraction process, they made these cake materials and they were all shipped out to the St. Louis facility. It's not really clear who monitored these workers and actually who they worked for. Manhattan Engineering District actually operated the SLAPS

facility, I think through 1953, and then turned it over to Mallinckrodt. And there are some indications of urine samples for guards there, as well as drivers. But since it's not clear, we're sort of reserving that and we're going to treat the SLAPS facility as an annex to the Mallinckrodt document as we become more comfortable with what was really done there and who was monitoring.

I mentioned this was a uranium refinery. It's a basic -- on paper, it's a fairly simple chemical process, but they did this on a very massive scale. The idea was to take uranium that was mined out of the ground and convert it to purified uranium metal. And to do so, it started with a digestion process in the nitric acid. You take uranium, digest it in nitric acid, add a little sulfuric acid, and that would precipitate out some of the radioactive impurities in there such as radium and lead. So -- and then when you filter out those precipitates, you end up with some -- some sludge, some slag. That becomes a problem. This will become apparent why this is an issue later, because those impurities really constitute some of the most

serious radiological hazards at the Mallinckrodt facility. Now I'm not down-playing the hazard of uranium, but radium-bearing materials were very, very hazardous.

So you would precipitate out the radium, then you're left with the uranium in solution, uranyl nitrate. Then the whole trick is to just dry that, convert it to uranium trioxide, which is known in the jargon as orange oxide. Continue to heat it, it turns into brown oxide, UO2, and then eventually uranium tetrafluoride, called green salt, and then uranium metal. I don't want to make uranium chemists out of you, but it's sort of important to understand the little steps as we go to understand the hazards associated with exposures here.

Just briefly, there were three periods of the operation that I'd like to characterize. The wartime period, '42 to '45, was characterized by the processing of primarily partially-milled ores. And what I mean partially-milled, the uranium was mined from the ground and then cleaned up, to a certain extent. It wasn't shipped in its raw, bulk form to Mallinckrodt in the early days. Most of these ores came from Canada at

that time. And they were, in this period, basically developing the production -- the process. How do you make your UO3, the UO2, that sort of thing.

What's significant here is the early postwar period, around '45, late '44 or '45. The demand for production increased dramatically, and to do -- to increase production, they not only increased plant size, but they also started processing what's known as just pitchblende ore. It's essentially uranium ore mined right out of the ground. It was not purified in any way, shape or form. Because of that, it contained a lot of these impurities, these radium daughters, radon, the whole -- the whole -- the K chain of the uranium series was present there. So during this period is when the real radiological hazards started to increase.

Through these three periods of course you have increasing radiologic controls that are documented in here. There were more -- more ventilation added, respiratory protection, that sort of thing. But this is the main period where we've introduced a lot of hazards.

After 1950 or so, Mallinckrodt no longer processed raw

pitchblende type ore. I won't say never, but the reliance on raw ore went down, and most of the ore that came in there had already been purified so that these radiological hazards were somewhat diminished, although not totally. I mean this is a trend thing. It's not -- this is not a cut period. I'm just trying to indicate what happened during the site.

There were other processes at this site, at Mallinckrodt. I mentioned the uranium recovery operation where they were trying to reprocess scraps. There was also an interesting production operation, what appears to be a one-shot deal, but thorium 230 is one of these residues in the ore when you precipitate it out. For some reason, Mound facility had a need for thorium 230, which is an alpha emitter. I could speculate, but I won't, as to why Mound needed that. But they ended up producing I think about -- they actually went and recovered a lot of the slag materials from the St. Louis Airport facility, brought it back and recovered I think -- it's anywhere from 100 to 500 grams of thorium 230, which is a lot of material. They had -- went through literally tons, I think, of slag to

yield that level of thorium 230. That happened in about the '55 to '57 time frame, so workers in that time frame were definitely potentially exposed to this -- in this thorium process.

Ores and other feed forms, I mentioned that previously. You know, Mallinckrodt processed either pure ore out of the ground or it was uranium that had already been through a mill, that had been cleaned up to some extent. And that, by definition, drove the radiological hazards at the facility.

Residues and other effluents, I think I basically covered that -- you know, the slag going to the St. Louis facility -- the effluents from the site, principally uranium effluents leaving the site. It was not a very clean operation. These effluents are not necessarily a real occupational hazard. They may be more of an environmental hazard.

Okay. The chapter on radiological conditions, considerations and available date -- that's a long title, it's a mouthful, but this, as a health physicist, is where you really start getting into some of the dose -- dosimetry aspects of what's going on.

Back then the units were milliRoentgen. The rem didn't exist in the early time frame. And in fact, it was milliRoentgen for gamma exposure and a unit called millirep for beta exposures. A rep is pretty close to a rad, it's .93 rad. These were the units that were used. The exposure limits back then were much higher than they currently are, though. In the wartime era, the tolerance level for exposure to gamma radiation was 700 milliRoentgen per week. That would equate, on an annual basis, to 34 rem, which is seven times the current occupational exposure limit in this country and -- actually five rem is the legal limit, but in Department of Energy facilities, two is the practical limit. So exposures were much higher for -- this is for whole-body gamma exposure. For extremity -- the hands, they were concerned about hand exposures -- the limit was 3,500 millirep per week, which roughly equates to 175 rem per year, contrasted to the current legal limit of 50 rem per year to the extremities. So some pretty high allowable exposures back then.

As time went on, the document describes how these limits dropped. Eventually they dropped down to 150

millirem per week as a tolerance level.
The internal dose considerations are sort of an interesting story. The tolerance level for internal dosimetry back in the wartime period was 500 micrograms per cubic meter for insoluble uranium and 150 micrograms per cubic meter for soluble. That dropped down to an AEC preferred level of 1949 to 50 micrograms per cubic meter for soluble, which was about 70 DPM per cubic meter, as their preferred level.
There's a long history behind this, and it's a somewhat confusing path that this unit took. And there's a whole appendix in this document that attempts to describe the history of the tolerance level for uranium exposures because it is confusing. You'll see different units and numbers all over the place. For the health physicists in the crowd, it's complicated by the use of what's known as a special Curie, which I won't go into, but it -- just suffice it to say that it's an interesting development and I think it's pretty well tracked in this document.
Internal dose considerations are documented, particle size, solubility, composition considerations. A number

of particle size studies were done. If you looked through the literature in the past, some of you may recognize Mort Lipman as a father in the field of respiratory inhalation toxicology, air sampling, that sort of thing. A number of studies were done there, primarily to demonstrate that the Mallinckrodt ore, the uranium ore, is dense material. So even if you have -- for a given particle size, it is so dense that it behaves like a much larger particle when you inhale it. It's just -- it's a mass density-based thing, so -- but the data are conflicting. There are four or five studies that were reviewed that have the size all over the board, although there is a tendency to indicate the particles are larger than what you would think. We are defaulting in this document to the ICRP-66 five-micron particle size, unless we have other information. Airborne dust levels were measured at the facility, and they're characterized -- I'll talk a little bit about those later.

Respiratory use was sort of recommended, but we can't demonstrate that it was ever even exercised with any degree of authority. And I can't imagine there'll be a

dose reconstruction where we're going to be able to take credit for respiratory use, even if it was. So there'll be a claimant-favorable assumption made in most cases that respiratory protection was not worn -- unless there's some document that pops out of the blue that says here is the certified program and here is how we controlled it, but I don't see that happening. Radon measurements -- we are assuming that radon -- radon gas itself is not really the hazard from breathing radon. It is the progeny, the daughters, the particulate that develop in the air itself that you breathe. So one has to make an assumption about what percentage of the progeny are in equilibrium with the gas. We are using a very claimant-favorable assumption that there's a 100 percent equilibrium in the internal dose calculations at every calculation we do.

Okay. We have a lot of information in this document on surface contamination levels. That alone does not indicate very much that there was an inhalation hazard, but it does give you a clue as to which areas were potentially generated airborne radioactivity and depositing on surfaces. There are fixed and removable

contamination levels. We have, as I mentioned, 40,000 urine samples. I'm not exactly sure how many breath radon samples we have. I know they were taking 500 samples a month at one point.

This is an interesting technique. It was used originally on the radium dial painters, some of you may be aware, where it's -- it's not radon exposure monitoring. It's how much radium you breathed in and subsequently deposit either in your lungs or skeleton. Eventually the radium in your body will evolve radon gas that you breathe out, so that's an indirect measurement of your radium body burdens. So there were large numbers of these done by the Health and Safety Laboratory in New York City.

Not much in the area of whole body counting and lung counts. There were a few people that were referred to whole body counters to some local facilities, but not much there.

External dose considerations, of course it's beta, gamma and other non-specific beta-gamma exposures. The gamma exposures arose from not only the uranium -- which is not a really intense gamma-emitter, but as I

mentioned, these radium products that were in the impure ore. Radium, and particularly the progeny of the radium, emit fairly intense photons, so that one could receive -- barrels were measured that were as high as 50 millirem -- milliRoentgen per hour around this Belgian Congo ore that was very high in these impurities, up to greater than 100 milliRoentgen per hour with the extracted slag materials. So we have a situation here -- again, after post-1944 -- where there are some very seriously elevated gamma exposures in the facility.

The beta exposures principally arise from the -- one of the progeny of uranium. There's a very energetic beta associated with protactinium 234M, principally an extremity exposure issue, and a skin. When one produces uranium billets, the impurities in the uranium tend to migrate to the surface, and so you have a cropping, a top slag material that is very intensely elevated in these beta products so that the hands would receive very large exposures. And in fact, I think in '49 or thereabouts this became a recognized problem and ring dosimeters started to be added to try to estimate

what the exposures to the extremities were at this facility, and we have some data to that effect.
Neutron exposure's not really an issue at Mallinckrodt. It is possible to generate neutrons in uranium tetrafluoride with an alpha end reaction, but this is very low enriched uranium and it's not considered in this document to be a real radiological hazard.
Okay, moving through, I mentioned we have upwards -- approaching 20,000 film badges. We don't really have any calibration information on these things, but we do have the badge design, which is not that different than some other facilities, so we can make some inferences as to what the badge actually -- the energy response of the badge was.
I talked about the extremity dosimeters. There were rings that were worn.
And occupational X-rays, it appears that annual chest X-rays were performed on the workers. We are making the conservative assumption that everyone had an annual chest X-ray, and we've reconstructed the X-ray exposures to workers based on what we know about the technology at that time frame, using an idea of what

the average type of X-ray equipment was in use at the time and the milliamp settings and that kind of thing. Other data of dosimetric interest, we do have a number of workers -- I mentioned 25 workers at the beginning to 1,500 within a few years. There are a number of studies we've located that talk about the average number of hours worked, and actually per job, what the -- you know, how long it took for a person to get ready to go to work, what they did for how long and that sort of thing. We're taking that into consideration, although where we don't know, we of course make claimant-favorable assumptions.

Job type and work areas in many cases were actually indicated on the film badge result cards, as well as some of the urine cards. So we do have data, to some extent, for workers -- where they worked and actually what areas -- or what they -- what they did in those areas.

Okay. I'm going to go on to one of my favorite subjects, the determination of internal exposures. We don't have data for everyone, so what ORAU has done in this document is allowed a procedure to estimate

intakes by using surrogate worker data. There are essentially what we would call a job exposure matrices in this document that took the urine sample data, those 40,000 urine samples, and they didn't use all of them. They were screened for quality and that sort of thing. And then made a job exposure matrix so one could determine what the intake would have been for a particular type of worker for a particular facility for a particular year. It's like a three dimensional matrix. That can be used to substitute for when data are not available. However, we recognize that there's uncertainties associated with this, so each of these values has some uncertainty distribution about them. We're not saying that this was the person's exposure. We have a central tendency value, along with a certain geometric standard deviation to account for the uncertainty in the calculation. And of course the way IREP works, the Interactive Radio Epi Program, we can put that uncertainty in there and it will be propagated through the calculation, along with all the other uncertainties of the risk models.

If we do not have any bioassay data in an area to judge

its intakes on, there are time-weighted daily average exposure information for many of the facilities. Some of these facilities were pretty high. I think in the early time frames it was not unusual to see 100 times that maximum allowable concentration value. And not frequently, but one can see up to 1,000 times the maximum allowable concentration in some areas. And even as late as 1956, I think six percent or more of the samples were still above the maximum allowable concentration. So I would characterize this as a fairly messy operation, even in the '56 time frame. Internal doses for missing periods are calculated using these intakes. They're put into the IMBA program that we talked about. The IMBA program then generates the actual doses using the current regulatory -- not the current regu-- the current ICRP models, the ICRP-66 lung models and such.

I should back up. I didn't say too much about the radon, maybe it's coming up, but the radon levels were fairly high here. I mean even by uranium mine standards, when they started to bring in this pitchblende ore from the Belgian Congo, I have seen

data, maximum air concentrations of 800 pico-- 80 nanocuries per liter, which equates to -- if it's 100 percent equilibrium, would be 800 working levels -- 800 times the allowable concentration back then. It would be 2,400 times the current allowable concentration in the U.S. facilities. So that's a very extreme maximum. But even in many facilities it's not uncommon to see one working level, two working levels -- even outdoor concentrations were elevated, and that's all depicted in some tables in this document.

Okay. External dose -- let me just check my notes here and see if I missed anything. Yeah, external dose, we really are relying mostly on the film badge data because we believe that to be the most accurate depiction of what the workers' exposures were. We use the real data when available, of course. And then based on our hierarchical approach in 42 CFR-82, the dose reconstruction rule, we would default then -- if we had no individual monitoring data, we would go to co-worker data and then gamma survey data, which we have all -- data in all three categories for the Mallinckrodt facility.

For unmonitored workers, and there were a fair number of them -- I mean not everyone was monitored. It did appear that many -- many workers were monitored and many workers had zero exposures on their badges, so it appeared that there was a tendency toward monitoring a large percentage of the work force. When workers were unmonitored, we are making the assumption that they had received at least the detection limit of the badge reading, which was stated in these documents at around 50 millirem -- 50 milliRoentgen back then. Given that there were weekly exchanges, the missed dose for these workers could have been as high as two and a half rem per year in the very early time frame. So again, we're making some fairly claimant-favorable assumptions here. We apply the film badge and dose monitoring data to look at the exposure conditions in the work site. There are tables in here about what the geometry of the exposure was. That is, what -- where was the person in relation to what -- where the badge was located on their chest. It makes a difference if the person was facing the source of radiation or their back was to the source, or they were walking around, you know, doing a

normal task or survey or something.
There are detailed tables in there to try to account for what those geometrical exposures were to the work force, based on job category, and also some inferences as to what the actual photon energy ranges were. As you know, the IREP program does account for the different radiation effectiveness factors for the different energy of the photons that one might be exposed to, and so that needed to be considered in this document.
Wherever these data are lacking, of course, again, the theme is we make claimant-favorable assumptions.
In the reconstructed dose area we have some situations where we have a -- we're trying to estimate a dose where the worker -- an unmonitored worker who has -- with and without any exposure records at all -- what I'm speaking about here is that early time frame, '42 to '45. If a person was not monitored in '42 to '45, but he has monitoring data in '46 onward, we can use what's known as a nearby approach -- it's published in the *Health Physics Journal*; it's a standard technique for dose reconstruction -- to try to infer, to

extrapolate backwards, knowing what we know about the trend of those exposures and the processes that were going on back then, to substitute for those exposures. It becomes a little more problematic when a person was unmonitored in '42 to '45, and was also not monitored after '45. We have to make some inferences there. There's some guidance in there. One has to look at the job category and make a decisions, was this person really potentially exposed or not. Even if they were not, I think -- not think, we will assign the average dose for what we believe to be in that unmonitored period to the worker. Again, a claimant-favorable assumption.

X-ray doses I discussed. These are covered using our estimation of what the conventional X-ray equipment at the time delivered to a -- to the individual organs in a standard anterior/posterior chest X-ray -- a PA chest X-ray, I'm sorry, posterior/anterior.

And I think that gets me to my last slide, just to finish up, other dose considerations. Extremity dosimetry, I did mention they wore badges on the hands so the skin doses could be very large. It is not

addressed in a large amount of detail in this Technical Basis Document. The health physicist will have to go out and research it a little further to figure out what the actual extremity dose was. There was not enough information at this point to flesh this out in any sufficient detail, so it -- it's not reserved. There are -- there's guides as to how to treat this, but we need to do a little better job -- right now we're making a claimant-favorable assumption about what the conversion factor was for the film badge reading. There's an open window/closed window reading. We are inferring what that was and -- and assuming that the factor is one, which is I think at this point claimant-favorable. We're still working on this.

Submersion in a cloud is not necessarily an issue in these exposures, with the exception of skin, testes and breast cancer. Those are fairly -- organs that are fairly close to the surface where we may have to worry about some submersion doses from the beta particles affecting the dose.

And shallow dose, as I mentioned, was measured on their badge using an open window/closed window technique that

is a fairly standard health physics tool. We feel we've got that characterized pretty well, based on the badge design.

Okay. I've talked for quite a while. I hope I didn't put everyone to sleep, but that's a very nutshell overview of what we've got in this document.

DR. ZIEMER: Thank you, Jim. I think we do want to take some additional time now for questions from the Board. Or comments.

Let me -- I'll start out. You mentioned the -- I think radon concentrations up to 800 working levels. Do we have any working level month values for any of the workers or --

DR. NETON: No, not at all.

DR. ZIEMER: -- or are you estimating those all from the concentrations?

DR. NETON: The only handle we have is the actual ambient air concentrations that were measured. And again, it would be 800 working level months if the radon were in 100 percent equilibrium. That's probably not the case, but we have no way of knowing.

DR. ZIEMER: So then you take the estimated times in

those positions and -- do you go to working level months from that and then --

DR. NETON: Yes, that's actually the input value in IREP. One needs to come up with the working level months in an individual year, and we've done that. We've actually moved some Mallinckrodt claims through doing that.

DR. ZIEMER: Let's see, Mark, you started to ask a question?

MR. GRIFFON: Yeah. I guess -- I wanted to ask if -- in the course of constructing the site profile, if NIOSH has any feeling now whether there are subcohorts or subpopulations of the Mallinckrodt site that -- for which you feel it likely won't be -- you won't be able to make a reasonable estimate of doses, or reconstruct their doses?

DR. NETON: No, we don't. I mean our plan is to take this document and move through the 180 Mallinckrodt claims that we have in-house and see if we can't -- and then if we can't, we need to make a decision at that point, but that's the way we would approach this. We haven't gone through a priori and looked through all

these and made some decisions.

DR. ZIEMER: Jim.

DR. MELIUS: Yeah. Along those lines, what happens if a person worked at any of the other facilities and then worked at Mallinckrodt? How are you -- we've talked about this before, sort of how to deal with this --

DR. NETON: Yeah.

DR. MELIUS: -- these issues with overlap, missing information and so forth, and again, I don't think you've gone through, but I suspect you have people that have moved around, and --

DR. NETON: Oh, yeah.

DR. MELIUS: -- how's that going to --

DR. NETON: That's a real good question. I think a large percentage of the people who worked at Mallinckrodt ended up working at Weldon Springs. I can't give you an exact number, but a large percentage. Those data will have to be added to the dosimetry that we do here, the dose reconstructions here, and -- you know, as an aggregate to determine compensability by Labor. So clearly we -- we can't do anyone who is non-compen-- if someone were to be over 50 percent using

the data here, then we wouldn't hold it up. We would just move that over to the Department of Labor. If not, though, we would then have to wait until the Mallinckrodt -- or the Weldon Springs or the Hematite or whatever other facility TBDs were done. That's just unfortunate, but that's the way it is.

MR. ELLIOTT: I'd add to Jim's response that we've actually finalized one dose reconstruction where an individual worked at both sites, and we were able to use the dose from the Destrehan Street site to get that person compensable without using the Weldon Spring site, so that's what Jim's referring to. When we can move people through the system without the other, we do. When we can't, we have to build that other dose into the profile.

DR. NETON: Larry knows very well, we're constantly sweeping through the system looking for claims that can be moved through, and this is a very routine process for us.

DR. ZIEMER: Roy and then Gen.

DR. DEHART: As you reviewed the documentation, were there incidences of adverse events that may have

occurred, failure of ventilation systems, other kinds of things that would have altered the exposure?

DR. NETON: There are a few incidents addressed in the Mallinckrodt Technical Bas-- or site profile, and you've sort of caught me off-guard. I can't recount what they exactly are. I mean I've gone through them, but there aren't that many. Now I'm not saying they weren't there, but we're primarily relying at this point on the air sampling data that were out there, recollections of interviewees, and that sort of thing. But we've gone through 150 documents looking for that type of information, and where they were available, we've characterized them. But -- you know, I don't know what else we could do in that area.

DR. ROESSLER: I appreciate this overview of a site profile because I have a much better understanding of what you've done, and it -- I think it seemed very thorough. But I do have a couple of questions, because it seemed like it -- it seems like it must have taken a whole lot of time. How many man or woman-hours did this particular thing, would you estimate, took?

DR. NETON: I'd probably have to defer to Dick Toohey

on that, but I know that there were two people working fairly -- for quite a while on this. It's been in process for months -- what would you say, six, eight months, Dick, has been the time period? And it's not just those two people, of course. It's the site data capture efforts -- much of this data we found at the Environmental Measurements Laboratory in New York City in a data capture effort. Of course we've taken advantage of the ORAU database that existed from previous studies. So it's -- yeah, it's massive. The tables are impressive, by themselves. So --

DR. ROESSLER: And I have a second question that's -- with regard to the occupational chest X-ray. I'm wondering what the -- what you assumed for the exposure or dose, and what part of the total dose, let's say to the lung or whatever this might be?

DR. NETON: Well, I don't have the document with -- I can't give you an exact number --

DR. ROESSLER: But it'll be in the tables?

DR. NETON: It's in the -- there's a table. I think it's Table 30 or something like that. Dick, do you know? That's okay.

I would guess 30 millirem, but that's -- that's a guess.

DR. TOOHEY: Dick Toohey, ORAU -- is this on?

DR. NETON: I think so. Just get close to the mike.

DR. TOOHEY: Okay. The chest X-rays were actually done at a hospital in St. Louis, so the document assumes that both an AP and lateral was done. And photofluoro* units were not used, so we're just giving them a typical X-ray exposure for that time, which would be about 30 millirem a shot to the lung. But if you compare that to the inhalation dose from the alpha emitters for lung dose, it's not very significant.

DR. NETON: I would say it's not just the lung dose that's in the table. We need to account for the dose -- the scattered dose to any other organ that developed a cancer, so one could figure out what the bladder dose may have been or the testicular dose, that sort of thing. So we do account for that, and of course the further removed you are from the primary beam, the smaller the dose is.

DR. ZIEMER: Larry also has a response on that one.

MR. ELLIOTT: I'd just like to add to Jim and Dick's

comment back to Gen about how long it took or how many people that worked on it. I don't know how many person-hours went into this. It was a good effort. I can give you this information, though. When we saw the first draft was in August, August 19th was when the first draft come to us. I don't know how long they worked on it prior to that, probably not -- not -- I don't know when they actually started. We gave them our comments back on September 2nd and it was -- ORAU provided the resolution to those comments on October 23rd and we finalized it last Friday. So that's the time line for the development of this particular document.

DR. NETON: Dick had one comment.

DR. ZIEMER: Leon?

DR. TOOHEY: Larry --

DR. ZIEMER: Oh, Dick.

DR. TOOHEY: -- if I may add to that, Janet Westbrook was the primary author on this, and she actually started working on this probably around last January, just reviewing the documents that NIOSH already had in hand and the ORAU database, and had some assistance

from Jerry Anderson, who is our lead TBD writer for AWE sites, but -- maybe I should say uranium sites in general, since most of them are -- so I would say what went into this, just on the ORAU side, was about one FTE.

DR. ZIEMER: Okay. Now Leon.

MR. OWENS: Dr. Neton, I would like to -- at least to your comments in regard to this question. The significant events, if we go through the claimant interview process and several claimants remember significant events that have occurred, and there's not any documentation relative to those events and it falls within the time frame 1945 through 1949 in order for those claimants to be compensable, what mechanism is in place to quantify those events from the standpoint of possible exposures?

DR. NETON: Okay. Well, we'd have to look at it in total. If we had several people corroborate the same event, we would take a look at it in the context of does that seem plausible, given what we know about the conditions in the plant at that time. For example, if someone was asserting that there was a criticality

accident somewhere, it would be pretty hard to come up with a technical scenario that could allow for that. But say it were plausible and we had sufficient corroborating evidence through affidavit or whatever on those conditions, then we would seriously consider and put that into the dose reconstruction. Claimant assertions are considered when they are -- seem credible.

MR. OWENS: Okay. From the standpoint of the affidavits, are you speaking of affidavits from the claimants themselves if there's a group of claimants who may have worked in a specific area and they have knowledge of this event that has occurred and we do not have any documentation to support -- support that --

DR. NETON: Yeah, this would be an affidavit assertion from the claimant, or the coworker, I suspect.

DR. ZIEMER: Okay. Jim and then Mark.

DR. MELIUS: I have some general questions on the process. I want to talk about the -- this particular site profile. I don't know, Mark, if you have other comments on that or -- you can go first and then -- either --

MR. GRIFFON: One thing, Jim, I just wondered if you could take a few minutes to expand on how the surrogate worker process is intended to work in this TBD. Specifically I'm wondering -- in my experience -- suggests that, you know, job title -- even job title by time period sometimes -- you know, some of these sites you have a tremendous number of job titles, first of all, not always descriptive of what they're actually --

UNIDENTIFIED: We can't hear.

MR. ELLIOTT: They can't hear you. I'm sorry.

MR. GRIFFON: Is that --

DR. ZIEMER: Just get --

MR. GRIFFON: The job titles aren't always descriptive of what individuals would be doing or where necessarily they would be working, so I'm wondering how -- how specif-- if you -- as specific as you can be, how are you using -- or intending to use this surrogate worker factor, and how are you sort of validating the use of that method, I guess.

DR. NETON: Well, we of course would start with the individual bioassay data if we have it. I mean that's sort of our standard approach. And then the next fall-

back measure would be to look at the intakes that were estimated based on urine samples in specific facilities. And you're right, if you don't know if the person were in a general facility -- you try to get as close a match as you can, but if not, you would pick the most claimant-favorable site or location within the building if you couldn't match it. I mean that's just our standard approach. So you know, the less it matches, of course, the more uncertain the dose -- the intake level's going to be, but that's just a fact of the way the calculation works out. If there were no bioassay data, then one is required to go back to these time-weighted average air sample data values. And again, the same situation will apply. Match as close as possible. But if you can't match, pick the next highest value that you can find in the table. That's a very brief sketch. I can't get much more specific than that. I haven't actually done one of these, but that would be the approach.

MR. GRIFFON: Just two follow-on, and these will be quicker.

DR. NETON: It may be informative to do an example or

two down the line, once we get these, you know, moving through. We actually haven't used this document yet to do any claims yet.

MR. GRIFFON: One other is did -- did you -- in the course of doing this -- you mentioned through interviews some documents are identified. Did -- how many I guess, quote/unquote, experts were interviewed in this process, and did you interview past workers, past health physicists? Who did you -- who were you able to find in do-- in putting together this document?

DR. NETON: I'm not sure I said through the course of the interview documents were identified. If I did, I didn't mean that, I suppose.

MR. GRIFFON: Oh.

DR. NETON: This was a document, a paper search through the Environmental Measurements Laboratory files, the archive of vaults at the Oak Ridge Associated Universities, those type of records.

MR. GRIFFON: So did -- did you interview any past experts or were you able to do that in -- so far in this process?

DR. NETON: I don't think we have interviewed any past

experts at that facility at this time.

MR. GRIFFON: Okay. And the last question is for -- the site profile is on the web site. All the support documents that are referenced, would they be av-- can they be in any way put on the web site or posted or -- or what's the --

DR. NETON: That's an interesting question. I'd have to look into that, Mark. There's a large volume of these records. We have all of our records available as scanned images, but I don't know -- I suspect, to the extent that the Privacy Act would not be violated, we could -- we could look into that. I really can't say what -- what or what we couldn't do at this time.

MR. GRIFFON: I mean I would assume there might be exceptions like UCNI or Privacy Act documents --

DR. NETON: Yeah, I --

MR. GRIFFON: -- but other ones I would think could be.

DR. NETON: I really don't know how large an effort it would be to post that on our web site. We could look into that and report back to you what could and couldn't be done in that area. I'm not against it, I just need to figure out logistically if that's

possible.

DR. MELIUS: Just one comment on the process here, I -- and I understand the time pressures. I don't -- not saying this was done on purpose, but I think in the future it would be very helpful for this committee to -- Advisory Board to receive copies of reports that are available before the meeting, so if we're going to be discussing a report, it's available. It would be helpful to have known that it existed and certainly to be able to have had a chance to review it if we were going to discuss it 'cause I mean -- can't really claim we've reviewed the document at this meeting. It's been a general presentation and so forth. And I'm not saying it was necessarily possible in this circumstance, and I think you did mean to get the documents out, but it certainly would be helpful in the future if we knew that they existed and would have a chance to review it before we came into this -- this meeting.

Secondly, this whole issue of that -- my assessment would be, from Jim's answer earlier, was that there was -- this was all sort of a paper exercise in terms of

reviewing available reports and so forth, that no one from the facility was consulted and so forth. And you know, given that this process apparently took six to eight months -- started last January, so apparently it's ten months ago -- I really find it disconcerting to think that there was no attempt to consult anybody during -- during that process. And now we're being given a final document that's been posted and all people can do is just sort of react to it. And I think that puts the program under incredible pressure in terms of the credibility of the overall process there. Any criticism that comes up -- and people are naturally going to be critical, naturally going to have a lot of questions since there was no involvement up to now. You know, NIOSH and ORAU are going to essentially -- forced to be -- to some extent, and maybe very appropriately, defensive about some of the decisions that they make. They may very -- may very well be entirely appropriate, but it certainly doesn't lend itself to a credible process nor to any sort of credible input from interested parties into the process. And so I guess my question is -- is, you

know, what is your plans in terms of involvement of interested parties during the development of a document, meeting with people once a document's in whatever draft stage, whatever we're going to call that, in terms of soliciting comments from people with some knowledge. And how is that process going to work and what's going to be the time frame for that process? If that's going to get extended out into a several-month process, I think that's going to further undermine the credibility of this process. So I don't know if Jim or -- you or Larry, who's making these decisions?

DR. NETON: I'll defer to Larry on this question.

MR. ELLIOTT: As you know, we have 15 of these going through this process right now in development. The schedule and the expectation and the goal that we have is to try to finish those up by the end of this calendar year. We've said all along that these are living documents and we welcome input and comment about them. We have, in fact, used and contacted, where appropriate and necessary -- example, Bethlehem Steel -- site-based experts to talk to us and provide

information or finding aids for information where we couldn't seem to find information on our own.
In this particular case, with the wealth of data and information and dose information on Mallinckrodt employees, I guess -- our opinion on this one was that we felt we had enough information that we could pull together this site profile and the necessary Technical Basis Documents that comprise it. We're certainly open and welcome any comment or input or reference to information that would make this document better and more improved.
It's our intent to engage site-based experts where we feel we can benefit from that. Our first goal, however, is to move these things through to completion so that we can start using them in the processing of claims. And so that -- that's our plan.
DR. MELIUS: So I guess my question still is are you planning to hold meetings -- I gue--
MR. ELLIOTT: I told you yesterday that we will hold meetings. We are going to hold meetings once the document is -- is ready to be presented as a -- the best effort that we could put on the table.

DR. MELIUS: Number two then, and I'm assuming that you then are rejecting any involvement of people -- union representatives, other interested parties prior to the publication of the document on the web site?

MR. ELLIOTT: No, I'm not saying we reject that. We will seek that where we feel that it is necessary and appropriate to place a quality document on the table.

DR. MELIUS: Where is that being done then on the other 12 or 15 documents that you're working on?

MR. ELLIOTT: I can't answer that about specific documents and the need to tap specific site experts. I'm not that familiar with each individual document and where they're at in that particular part of the process of development.

DR. MELIUS: Well, I'm -- just for the record, I find that to be a very unsatisfactory answer. There's nothing scheduled. There's no commitment, and I think that's going to seriously undermine the credibility of this program, and I think you're making a major mistake in the way you've approached this, and I think it's going to cause a lot of future problems with this program. And I really urge you to reconsider that and

develop a process for input. We talked about some of the ways of doing that yesterday. We talked about it at the last meeting, and I think it's imperative that you consider doing that or reconsider the way you're approaching this.

Secondly -- and just again for clarification -- a member of the public comment period, Richard Miller, brought up the issue of conflict of interest, and it's another area that I think -- again, have a lot of concern about in terms of this program. Again, it's something that's going to undermine the credibility of these documents and Richard brought up some examples. I'm pleased that you're following up on that, but I think the development of a policy in that regard is to -- both for the institution or the organization involved, as well as for the individual people involved in these dose reconstructions, again, would be I think very helpful and it's imperative for this -- the credibility of these documents. And all the more imperative if you're not going to provide any public input into the development of the document. Once it's out there, it's -- and people -- questions are raised

about the people involved in developing the documents, I think it's going to be -- raise a number of serious concerns. People -- again, undermining the credibility of this process.

DR. ZIEMER: Okay. Further comments relating to that issue or any other issues on the site profiles? Anything specific on the Mallinckrodt site profile at this point?

(No responses)

DR. ZIEMER: Okay, thank you. You've heard the comments. My -- as I understand, let me insert here, also, I -- it seems to me important that we recognize the issue of the documents being dynamic in the sense that at some point you put something out on the web site. Is it complete? Perhaps not. I would guess they are never complete. Have you been able to tap all resources? Probably not. It seems to me the underlying issue is when is a profile ready to put out there, whether you -- regardless of who you have or haven't talked to and regardless of what material you've looked at, at some point you're putting it out there. I think what you've told us here on this one,

that you had a pretty good wealth of information. It's out there now. If there are other input sources, this would be modified, as I understand it. This is not a final -- we should not regard this as the final site profile. This is the version 1.0 or something like that, and as you garner additional information, either through claimants or other representatives who can come forward now and say well, that's -- that's good, but I happen to know this fact or this situation -- then I assume the process allows for modification.

The other part of that is at what point is a site profile ready at least to use for helping get some claims through, what was earlier referred to as the -- the low-hanging fruit, those that you can move through based on what you already know. Even though there may be further refinements later that will be helpful and useful for additional claimant processing, this, I gather, information has already been useful in helping --

MR. ELLIOTT: Yes.

DR. ZIEMER: -- process a number of claims from this site. Is that correct?

MR. ELLIOTT: Yes. Again, these documents -- we call them living documents. To us, that means they're documents under development. We present a document on our web site when we think it has reached a state of quality that it can be used.

As you see, this document -- this site profile has one Technical Basis Document, or a chapter, if you will, incomplete. And Jim has identified some other areas that we're working on in addition, other chapter areas that are being reviewed and modified, as appropriate. This is Rev -- what we call Rev 0. It's the first version that we are comfortable with putting on the web site, sharing for public comment and input. Welcome that, again.

I believe the Savannah River document is now Rev 1. We made changes in the document and the web site, identify what changes have been made to that document.

As this Mallinckrodt document goes through further development, as input is provided, as we review and evaluate that input and make changes, the document version will change and those changes will be so identified in each document.

We're -- again, our goal is to put a quality document on the table for use by the health physicists doing these dose reconstructions as quickly as possible for the benefit of the majority of claims. We -- again, we also have points along the way in our process where individuals can offer comments about their particular experience at the site and identify those, and we take those into consideration. Those come from the interview process, they come from comments about -- about dose reconstructions completed, comments about the Technical Basis Documents and the site profiles. You know, so it's kind of a cart and horse thing, I guess. If we go into a participatory development process, we're concerned as to how long that will take, what the benefit will be. We think this is the most expedited way to develop Technical Basis Documents and full site profiles and get them out for public comment and input. So it is a living document, it is under development. We're not saying that it is final in its content at this point in time. We've even identified the areas that we're continuing to work on.

And one last time, we welcome comment and input.

DR. ZIEMER: Mark?

MR. GRIFFON: Yeah, just a thought that I had about the -- you know, you mentioned that no one was interviewed, but you do have -- from this process, you did have what, 400 or so claimants from Mallinckrodt. Is that accurate --

DR. NETON: Actually it's 180, I think, or --

MR. GRIFFON: Oh, I'm sorry.

DR. NETON: I've heard 400 being mentioned, but I assume that includes Subtitle D claims, I don't know.

MR. GRIFFON: 180, did you use those interviews in any way, did they aggregate comments from each individual interview into like an interview report? Did anybody in any way --

DR. NETON: I will say that in our NIOSH review we go through and look through selected interviews to make sure that -- that ORAU has -- there's not something in there that is inconsistent with what the Technical Basis Document is saying. I mean that -- that happens.

MR. GRIFFON: Okay.

DR. NETON: Now we have not gone through all 186 or whatever cases there are, but we do go through them and

-- to see if there's some pattern here that is way out of kilter, so that does happen.

MR. ELLIOTT: Just for the record, let me clarify. We have 148 claims from the Mallinckrodt Destrehan Street plant. There were, as of October 27th, 144 interviews had been scheduled; 143 of those had been completed; 140 of those interview reports had been shared with the claimant and returned. There had been 33 dose reconstructions started. There had been 22 dose reconstruction reports sent back to the claimant and there were a total of three completed and sent back to DOL. And I can't speak specifically, as Jim can't right now, about how many of the interview comments were actually used in these -- these cases.

DR. NETON: I don't have that information. But I think I was -- maybe 180 is the number of claims, not cases. I -- there is --

MR. ELLIOTT: These are cases I'm talking about, 148.

DR. NETON: Okay, those are actual individual dose reconstructions. I really don't know the number that we've gone through, but we do -- that is part of our process, to look at the interview.

DR. ZIEMER: Jim, further comment?

DR. MELIUS: Yeah, just in response to what you said, Dr. Ziemer, these -- first of all, I don't think commenting to a web site is necessarily, you know, full public and open public process. I understand sort of the bureaucratic need for that, but I think that we really need a much better outreach program in order to solicit comments and let people know that these -- that documents are open to interpretation and to comment and so forth.

Remind you that the Savannah River document, when it first went on the web site, was no mention of the opportunity for public comment on that, at the time we saw that. That's since been revised and we appreciate what Larry and his staff has done, you know, in response to some of our comments from last time.

But again, these documents are also going to be used to reject claims. And if we're going to have a process where these com-- if there are significant flaws in these documents that will have led to the rejection of claims and people see that happening or there's uncertainty about that, I think it's just going to

undermine the credibility of the program. I think there's going to be a lot of bureaucratic inertia. And again, I appreciate Larry's and the staff's intent to be willing to change and admit that mistakes were made, but there's going to be a lot of resistance to doing that. Going to try to -- would like to avoid it, everyone would. And I think not having a process that allows input in -- just to make -- ensures that people trust the way the document was developed, feel that it's complete, that areas that were left out were appropriately left out and so forth would really add a lot to the overall credibility of the process. We don't want to have to be in a process where we're constantly revising our dose reconstructions and -- well, you're out; you're in -- you know, whatever. I think that would be a serious problem, both in terms of the efficiency of the process, as well as the credibility of the program. And that continues to be my concern and I think we -- we deserve a better response than that and I think the program would be much better if it had such a program.

DR. ZIEMER: And I appreciate your concern there, Jim,

and let me add that I certainly support the idea that we should be proactive in getting input from workers as well as some of the HPs and professionals who worked at the sites. I certainly support that.

You have additional comments, Larry?

MR. ELLIOTT: I just want to make a clarification, Dr. Melius. The documents won't be used to reject claims. The documents will be used to provide estimates for dose and then whatever that dose is, it'll either be compensable or non-compensable. I appreciate your concern. We've heard, as I said last -- yesterday, we heard individual comments and I've reacted to those individual comments. If there is Board consensus on this, then you need to -- you know, this is a consensus body, and we have reacted to individual comments. If there is a consensus of the Board, I need to hear that.

DR. ZIEMER: Wanda?

MS. MUNN: One would hope that we would remember the cautionary words of Dr. Till when he spoke to us with respect to the need for establishing a policy of when the science that we have is what we're going to use, and recognize what is the reality in terms of

imponderables that cannot be defined clearly. My memory of his warning in that respect was that failure to do so creates more confusion for the claimants and for all of the people who are involved. He further warned that the experience his body had had with other similar kinds of boards and programs was that the claimants did not clearly understand what the level of exposure had to be in order to be compensable, and that all claimants should be continually reminded that there is a level that must be shown before compensation can be considered.

We are, at this juncture, moving into the real meat of what this program is all about. If we're very clear about what our policy is regarding when we can move forward, as we're doing in this particular case, and when we still have too large an uncertainty to do so, it may be beneficial to us not only in this case, but in all of the site profiles that we have to face in the future.

DR. ZIEMER: Thank you. Mike?

MR. GIBSON: You know, I'm going to respond a little bit to what Wanda said. I don't think we're

questioning the science of health physics at all. I think what we're questioning here is -- we've had a department of the government, DOE, readily admit that they improperly monitored workers. They paid contractors to get work done and didn't monitor these workers correctly. These same contractors who got that pay, they generated these records of the exposures and the levels of exposures. So in essence, management has already had input into this process. What at least I'm trying to say, from a worker's perspective, is that I think we need that same input along the way, as opposed to just taking managements end of what they say the exposures or the events were. I'm not -- I'm not questioning the science at all, and the level of exposure it takes to get various cancers or various illnesses. But it's the adequacy of the records that a Federal agency has went on the record and said they improperly monitored people for.

DR. ZIEMER: Jim, did you have another comment?

DR. MELIUS: Yeah, I'd like to offer a motion. I move that the Advisory Board recommend to NIOSH that they develop a process for public and site expert

participation and involvement in the development of the site profiles, that this participation include both prior to the publication of the site profile on the web site and for comment and participation after the initial publication of the document.

DR. ZIEMER: You've heard a motion. Does someone wish to second the motion?

MR. GRIFFON: Second.

DR. ZIEMER: Mark wishes to second the motion. It's open for discussion. You wish to speak to the motion, in support of or if you wish to speak against the motion, or if you wish clarification of the motion -- or do you just wish to ponder the motion?

Leon Owens, okay.

MR. OWENS: Dr. Ziemer, I'd like to speak in favor of the motion. I think that the site where I work is a Special Exposure Cohort site, so there have been workers who have received compensation based on that. And yes, it was a political issue, as we all know. But I think as we enter into the Subpart -- Subtitle D claims, there has to be some consistency in these profiles, and I think that -- I agree with Mike Gibson.

We're not questioning the science, but there are a lot of folks that are in this audience that heard Dr. Neton's presentation and to them, whether it's a rem or millirem or any number of other issues that are raised relative to exposures, that doesn't mean anything. The question is, they were lied to by the government. That's been an admission of that. There were family members that were put in harm's way. And so I think we need to be as transparent in this process developing these profiles as possible.

DR. ZIEMER: Thank you. Tony?

DR. ANDRADE: Is this mike on?

DR. ZIEMER: Yeah.

DR. ANDRADE: Yes, indeed, the process should be transparent. However, whether it's a millirem or a rem has everything to do with this process. And one has to start somewhere, and the way to -- I believe that NIOSH and its contractor proceeding -- ORAU -- is going back to the records that were developed and that have been kept, and I'd say it's an unfair assumption to make that the records are all false, that they are all untrue, that folks like myself who ran a radiation

protection organization would falsify these things. Perhaps some have been destroyed, perhaps some were not treated specially or were scattered about. And there have been instances and DOE has owned up to it. But to make an a priori assumption that all records are bad, false, lies, et cetera is just unconscionable insofar as I'm concerned as a professional, because that really attacks me personally.

So what I am saying here is that you have to start somewhere, and that somewhere has to be dispassionate, and that dispassionate piece has everything to do with the records. And if we're going to determine what doses are -- okay? -- compensable or not, you need to know whether it were several rem, 50 rem, hundreds of rem or a few millirem. And the starting point is what is on paper.

Then -- then -- I believe that the process that's in place right now -- and I agree with Dr. Melius, we should have perhaps a larger outreach effort to let the public know that they can comment, that they can call in and talk about maybe special events or -- or extraordinary events that occurred during -- while they

were working and have those either confirmed or put into the record or analyzed or gone back and researched. But you do have to start somewhere. And so I vehemently state that the process that is in place right now is appropriate, yet we do need those outreach efforts that Jim has talked about.

DR. ZIEMER: Okay.

DR. ANDRADE: Thank you.

DR. ZIEMER: Gen and then Leon. Jim, are you up again, too?

DR. MELIUS: Yeah.

DR. ZIEMER: Okay. Gen.

DR. ROESSLER: Tony sort of said one of the things I was going to say, and that was about the outreach effort. I think that if anything is -- needs some improvement, that that is one of the aspects. But specifically with regard to the motion on the floor and how we're going to vote, I'm trying to think back through this particular site profile and get an answer from you, Jim, as to what you would have done differently and how you would have gone about it. I think this is what we really need to evaluate.

In addition to the looking at the interviews with the claimants, can you say how you would have approached it differently and then at what point in time the information would be made public for comment?

DR. MELIUS: Well, the motion that I was offering was that NIOSH develop a process, so I think that process should be flexible, and it's going to be different for different -- different sites. I guess I'm more familiar with Savannah River. Savannah River, where there was no notification or outreach to any of the unions telling them that this process was underway. Secondly, the medical screening program that's based at the medical college and other groups down there was never contacted to seek out what documents and other information they might have. So I would see the -- the public involvement, whatever we want to call it, prior to the development -- or during the development of the document, meaning to seek out what resources and sources of information would be available. So I think that's relatively straightforward, be set up through meetings, you know, with various interested parties at the sites and let them know what's going on, seek what

information might be available, what's been found so far and what additional sources might be available. Then once the document's more developed, then a process where it would be shar-- you know, the information shared, presented. And again, just as a final check on what other sources of information might be sought -- what might be missing from the document or what records might be missing entirely that might have been overlooked. I think our concern about these documents is more -- not what's in there, 'cause I think what's in there is getting a good technical review and so forth. It's what's not available and understanding what might be missing. And so I think -- you know, I -- trying to defer as much to NIOSH and NIOSH contractor staff to let them develop a program that they feel doesn't hamper their progress, but at the same time informs people as they go along, gives them a chance for some input and then a more formal review --

DR. ZIEMER: I'd like --

DR. MELIUS: -- this document gets completed.

DR. ZIEMER: Thank you. I'd -- before Leon speaks, I'd just like to insert here, use the Chair's prerogative.

I think ultimately we're all after the same thing. By "all", I'm talking about NIOSH and its staff, the Board, the various sort of facets represented on the Board, whether it's medical, science, labor, whatever. And that is we want a good quality product.

We also need to recognize that some -- not all, but some of what appears to us now to have been sort of "lied-to" issues reflects ignorance. In fact, the changing dose limits which were described by Jim, which were originally in the 35 rem per year range and which are now five rem per year -- and maybe I should express it in sieverts to really be up to date, but in any event, the changing dose limits themselves reflect changes in knowledge of the biological effects of radiation. And there was a lot of ignorance going on -- not that ignorance justifies what was done, but a lot of what we look back at now and say well, you know, they were giving us all kinds of high doses. When I started my career, the dose rates were much -- dose limits were much higher.

There was also -- I know, because I've seen it myself -- in the urgency to get something done, and in the

weapons program particularly that urgency existed, there were -- there was a different mindset. We -- in fact, one might even argue that people in those days themselves accepted more risks in the war effort. I don't know that that's necessarily true, and there certainly were these cases where you get things done at all costs and, you know, regardless of what the impact on the workers -- and we've seen this in all kind of industries, anyway.

But be that as it may, there were some mistakes made, even by some of our best professionals in the past -- what we'd now call mistakes simply which were a result of ignorance or lack of information.

I think the issue of falsifying -- there may have been cases of that, but I would argue that probably they are few and far between. And if we knew of specifics, we certainly would want to take that into consideration. But again, the issue of getting input from the worker side, I think we need to respect that and make sure that there's some way to get that done. If it takes formal action -- I know that NIOSH wants to accomplish that. If they need to formalize that in some way,

perhaps that's useful.

Leon, you had a --

MR. OWENS: (Off microphone) (Inaudible) the rest of my comments. I'm fine.

DR. ZIEMER: Roy?

DR. DEHART: I support the motion, but in saying that I want to make it clear that I have no doubt at all that NIOSH has done a good faith effort to come up with the best that they could with the data that they have. The reason I support the motion is that it's a divisive issue. We have heard time and time again of the need for the experts in the field and the workers to participate as much as possible. This is an opportunity to continue that participation. However, I think it's a mistake if you assume that this will resolve or remove any issues. It will not. What it will do, though, will give one more step of protection to NIOSH as it moves forward to try to accomplish these evaluations.

DR. ZIEMER: Mike, you have another comment, then Gen.

MR. GIBSON: Just for the record, I don't want to say that I'm questioning the credibility of any particular

rad professional, but I know for a fact there are some in the complex that have put production over safety and put employees in harm's way, and there's even documentation been sent to management making them aware of the situation, and it was avoided. I know that for a fact, so it's -- I'm not questioning the credibility of most of the rad professionals. But you know, just like there's -- there's union employees that we have to represent that's got caught sleeping on the job, there are some out there.

DR. ZIEMER: Yes. Thank you, Mike. Gen.

DR. ROESSLER: I, too, support the motion. I would like to say, though, that from my evaluation of what was done in this particular site profile, I think it was very well done. I do think that Jim's caution for the future we should keep in mind, and I think it gives the Board direction as to what we prioritize when our audit contractor begins their work.

DR. ZIEMER: Thank you. Jim or Ray, would you read the motion for us again?

DR. MELIUS: I'll do it. The -- I -- Advisory Board recommends that NIOSH develop a program for public and

site expert participation in the development of the site profiles, that this involvement should include involvement prior -- during the initial development of the site profile, as well as when -- at the time when the -- what they call -- the final draft document is about -- is ready for publication on the web site.

DR. ZIEMER: Okay. Wanda, you have an additional comment on the motion?

MS. MUNN: Yes, I do. I want to make it very clear that although I'm going to vote against the motion, the reason I'm voting against it is because I think it is incorrect procedurally. There is no question in my mind that all sources of valuable information need to be incorporated into the final document. My observation of what transpires with public hearings and with wide open input prior to having a document in front of you to work from is cumbersome, at best, and is extremely time-consuming for all involved. My -- again, in personal experience, what has transpired most effectively is to have a valuable document based on the best evidence that can be supported by record, and then have input to that if there are shortcomings or errors

to it.

DR. ZIEMER: Let me also clarify. I believe the motion doesn't mandate how this process is to be carried out other than to ask that there be that input. It could in fact be a process that looks exactly like what has occurred. Yes.

DR. MELIUS: It -- well, I --

DR. ZIEMER: The motion.

DR. MELIUS: Yeah.

DR. ZIEMER: I'm saying that the motion does not mandate the process.

Let me add this, also. Recognize that this Board is not a management board for NIOSH. We do not manage their process. The -- if the motion passes, it tells Larry what the sense of the Board is, and that's his prerogative to use that as he sees fit, or as he doesn't see fit. Understood. You know, our prerogative is to recommend things to the Secretary. This is not an issue that we go to the Secretary and say make Larry do this. This is -- Larry has actually asked for the sense of the Board here on this issue. Now I understand -- yeah, Jim.

DR. MELIUS: Yeah, but can I just clarify --

DR. ZIEMER: Clarify your motion.

DR. MELIUS: Yeah, the -- it's to develop a program now.

DR. ZIEMER: Right.

DR. MELIUS: Trying to give enough flexibility --

DR. ZIEMER: Right.

DR. MELIUS: -- in terms of what there should be.

DR. ZIEMER: Right.

DR. MELIUS: That's...

DR. ZIEMER: Does everyone understand the motion now and are you ready to vote?

Okay. All those who support the motion will say aye.

(Affirmative responses)

DR. ZIEMER: Those opposing the motion, no.

(Negative responses)

DR. ZIEMER: And any abstentions?

(No responses)

DR. ZIEMER: Then the ayes have it and -- and the record shows Rich is not here, and Henry is not here, so there is -- nine Board members present and voting. Okay. We need to take a break -- 15 minutes. We're a

little behind schedule, so be promptly back in 15 minutes.

(Whereupon, a recess was taken.)

WORKING GROUP ON OPTIONS FOR EVALUATING INTERVIEWS

DR. ZIEMER: I'm pushing us here because we're a little bit behind schedule and I'm hoping our next two items we can move through efficiently.

First of all, working group on options for evaluating interviews, and this is our working group that Jim Melius was heading up. Jim, are you ready to report to us on your work group's activities?

DR. MELIUS: Yes, and I think we can -- we can make this as brief or as long as you want, so that's --

DR. ZIEMER: Okay. Now our next item...

DR. MELIUS: Let me just update you on where we are. The working group, which includes Tony, Wanda, myself, Mike Gibson and Rich Espinosa, had a telephone conference call, I think about three or four weeks ago for a couple of hours with NIOSH staff. And we met again briefly yesterday and we have further plans, which I'll get into in a second. So we have no recommendations to report to the full Advisory Board

yet. We should have that by the -- at least something by the next meeting.

As you recall, the working group was formed to try to address the issue of to what -- where -- which the Board is -- there's disagreements among the Board on whether -- how extensive and how to evaluate the interviews that are done as part of the dose reconstruction. And particularly whether there is a need for a secondary interview or a follow-up interview, whatever we want to call it, to evaluate the quality of the first interview or whether that can be done in -- in some other manner.

Rather than address that question directly, we decided to sort of work at it from the other end, which is by reviewing the entire process that NIOSH and ORAU uses now in conducting the interviews, how those are done, how people are trained, what type of quality assurance/quality control there is. How does that process -- the -- how does further information get added to the record 'cause that would tell us something about the quality of the initial interview, so forth.

We discussed that with NIOSH staff and gave them --

during our conference call sort of gave them a list of what kinds of information we were looking for. They provided that to us. Included, for example, the OMB package that was -- at least the main OMB document that went up that -- when the interview was first approved. When we met yesterday we asked them for additional information, particularly as it relates to how ORAU is now implementing the interviews. And there's been a transition from NIOSH to ORAU and so there's -- I think a number of procedures that are under development or have been developed and to some extent it's a moving target, but we've asked them for some additional information to clarify. And what we're really looking for is, one, is the process; how is this reviewed. And secondly, how is that review recorded, so is there a record of sort that could be -- be tabulated, reviewed in some way. And I think we -- we've got a lot of useful information.

We're not ready to -- don't have it all and we're not really ready to make a recommendation. I think by the next meeting in December we should be ready I think for -- hopefully for a good discussion of this issue with -

- and be able to present some options that the Board can consider or ask the working group to go back and further develop some particular options.

DR. ZIEMER: Thank you, Jim. Very good. Let me ask if any of the Board members have questions to ask for Jim -- of Jim about the work of that working group.

(No responses)

DR. ZIEMER: Okay. We'll look forward then to hearing from you next time.

RESEARCH ISSUES

DR. ZIEMER: Let's go ahead and ask Russ Henshaw to make his presentation on research issues. And I believe there is a packet in your booklet from Russ, as well. Russ.

MR. HENSHAW: (Off microphone) Can everyone hear me?

DR. ZIEMER: Move it up just a little bit, Russ.

MR. HENSHAW: How about now?

DR. ZIEMER: That's good.

MR. ELLIOTT: Russ, if you put it on your right side in case you're looking at the screen, you won't be talking away from the mike. Thank you.

MR. HENSHAW: Is that okay?

DR. ZIEMER: Uh-huh.

MR. HENSHAW: Thanks. Well, I'm Russ Henshaw, an epidemiologist with NIOSH's Office of Compensation Analysis and Support office. I might start by saying that as I was preparing my presentation I had an inclination that there might be -- I don't know -- maybe a smidgen or two of controversy involved with my little corner of the EEOICPA world, that would be research issues, particularly as they relate to cancer risk models in IREP. I would say that this morning's discussion served as a humbling reminder that everything is indeed relative. So there may be a little controversy involved with this, but it should be fairly smooth going.

I just want to share some of the things with the Board that we've been thinking about at NIOSH relative to research. I'd be very happy to entertain questions at any point during the presentation, or afterwards, so I don't -- I don't mind being interrupted.

What I'm going to discuss this morning is really three broad areas. One -- the first is consideration -- considerations for adopting and implementing

modifications to cancer risk models. I'll talk a little bit about some types -- some types of risk model adjustments, give two examples. One example is the recent change we made to the thyroid and leukemia latency models just earlier -- earlier this year. I'll go into another example, a possible change for the future. I'd also like to discuss some criteria to keep in mind as we consider the results from research studies and whether or not to implement them; and if so, how to apply them to IREP. Talk a little bit about the issue of timeliness, specifically what are realistic time frames for conducting and completing research. And also a little bit about what I think are some special problems associated with implementing research findings, particularly those that may include a lower -- may include an effect that lowers probability of causation.

The second broad area is an update on research topics, those issues that have been discussed at the Board. In prior meetings you recall there was a priority list that was decided upon. We've been discussing that at length in NIOSH. I'll talk a little bit about where we

are with some of those issues.
And then finally, I think this would be a good time to try to summarize the current differences between NIOSH-IREP and between the NCI version of IREP, which is really officially known as NIH-IREP. It's -- may be particularly appropriate since the final report of the working group to revise the radioepidemiology tables has been completed and -- I'm not sure exactly where that is right now, whether it's actually available, but it's at least -- at least has gone to the printer, so far as I understand it.
Okay, adjusting NIOSH-IREP risk models. Part of NIOSH's mission under EEOICPA is to periodically improve the fit of the cancer risk model, as science warrants. As new research and new data prompt adjustments to these models, the models that in fact determine probability of causation, the effects are likely to range from very slight to very substantial. And the interpretation of research findings is complex, particularly trying to take findings and adapt them to NIOSH-IREP.
For example, take the recent adjustments we made to the

leukemia and thyroid cancer latency models. And by the way, I'm using the word "latency" to refer to the time between exposure and diagnosis, not a clinical definition of latency.

Just to recap briefly, you might recall that we -- that NIOSH observed a problem with those models last year. Specifically thyroid cancer and leukemia were the only two cancer models in IREP that conferred zero risk at short latency periods. It was within two years of exposure for leukemia and within three years for thyroid cancer. The other 30 cancer models all conferred at least some non-zero risk at short latency. Well, we felt that, frankly, the science did not support those two exceptions. We then asked SENES-Oak Ridge, Incorporated, the firm that developed NIOSH-IREP, to create new models conferring some risk at short latency. Because of the unusual -- maybe not unique, but at least unusual -- nature of this modification, namely that we predetermined that no -- that PC should not be lowered for any potential claimant, we specified that to SENES in creating the risk models. And we learned some lessons from that

experience.
Number one is that it's very difficult -- and I'll talk more about this later. It's very difficult to specify, for any model change, that there be no decrease in probability of causation. IREP is so complex -- 32 cancer models, not even counting the special model for lung cancer caused by radon -- that there are literally thousands of different possible variations in any -- for any one claimant.
In that case -- in the case of thyroid and leukemia adjustments, it took a considerable amount of testing and retesting, and a number of adjustments, to ensure that no claimant would be adversely affected. Still I would categorize that modification, in the overall scheme of things, as a relatively minor adjustment to IREP. Actually few claims were affected, and in our view, it really fell more into the category of an oversight than a -- some major change in risk modeling. Probably, if we were able to go back in time, those two cancers would not have been accepted from the -- allowing some risk at short latency periods.
In this particular instance, NCI eventually agreed with

our interpretation and modified NIH-IREP so that it -- those two models are exactly the same as ours, and the Board endorsed that change. Still, for a relatively minor adjustment, it took nearly a year to implement. We actually observed the problem I think in July, 2002 and finally made it effective in IREP in May, 2003. Going on to another example, this is a possible example for the future, namely the lung cancer and smoking model. This has been, as everyone knows, a particularly controversial part of IREP because we adjust for smoking. It's the only -- the only cancer risk model that makes any adjustment for behavior. NIOSH agrees that our current lung model should be reviewed, especially in light of the recent paper by Pierce published earlier this year in *Radiation Research*, and a paper that's already -- even though it's one study -- proved to be influential. NCI, for example, has completely modified their lung cancer model according to the Pierce findings. That included, by the way, some additional work by Pierce. NCI actually commissioned a -- an additional data analysis by Pierce, a customized analysis, specifically for

application to the IREP lung model.
The Pierce study was entitled "Joint Effects of Radiation and Smoking on Lung Cancer Risk Among Atomic Bomb Survivors". You might recall also that Dr. Owen Hoffman of SENES talked a little bit about those findings at a Board meeting earlier this year in Oak Ridge.
What Pierce did was examine the smoking history and lung cancer incidence in what amounted to a subset of the Japanese atomic bomb survivor cohort. It was a net cohort of about 45,000 persons, with follow-up through 1994.
Well, NIOSH now has several options, and I want to emphasize that these are not mutually exclusive. One option obviously is to adopt the risk model utilized, created and implemented by NCI. And please don't read between the lines. There is no hidden agenda in here. We have no decision at NIOSH to do that. We're just at the beginning of considering this whole matter.
We might also independently review the data or commission an independent review of the data from the Pierce findings. At a minimum, we certainly need to

evaluate the new NCI model much more carefully in order to thoroughly understand the assumptions made in creating the model. No one in NIOSH -- at least at OCAS -- has had a chance to do that in any -- with any degree of thoroughness at this point.

Another option would be to take a more cautious approach, kind of wait until the dust settles on the Pierce findings. After all, it's only one paper. We might also solicit expert judgment. That list, again, is not -- those options are not mutually exclusive nor exhaustive, just some options we might consider.

It kind of segues into the issue of what are appropriate rationales for modifying the cancer risk models. Obviously the scientific value and the applicability of findings range from fairly weak to very substantial. In general, we think that prudence should always be exercised in considering any findings, especially if the findings from studies are in conflict, that there's been no replication, if the results are suggestive but not considered statistically significant, problems with study design, disagreement among experts, implausible dose response associations,

possible bias, et cetera. There's nothing new here. These are factors to consider in evaluating any study. What are stronger scientific rationales? Well, they include studies that are well-designed and have been peer-reviewed, replicated, and I might also include in that list ongoing, systematic studies with updated data analysis. That would be one value of the Pierce study. One detriment would be, again, it's only one study. Also expert panel recommendations such as the BEIR VII report, which we're all anxiously awaiting. Other expert consensus -- I might also mention that since the EEOICPA program compensates for cancer incidence -- getting cancer, not for cancer mortality, that incidence studies are naturally more compelling than mortality studies.

And what about evidentiary concerns? Sort of borrow from the legal world, weight or preponderance of the evidence is one standard typically used in civil cases. Is that sufficient for modifying an IREP risk model? Maybe in some cases, maybe not in others. I think in general, it depends on the potential impact on probability of causation. I would say the greater the

impact, the more stringent the standard should be for implementing any findings. Maybe the evidence should be clear and convincing, or even -- even greater. Those are all things we need to consider.

There are also of course instances in which policy affects IREP modifications. That's no secret. In general, though, NIOSH is required and committed to use the -- use science to its fullest -- fullest advantage and, where science fails, to err on the side of the claimant. Of course the Board is always welcome and encouraged to weigh in with comments, as are the public.

I think another issue is, to put it bluntly, the usefulness of research. And in that category would be the time frame for conducting and completing studies. I don't know that there's a hard and fast rule, but I would say, for example, that it would probably not be in the best interests of the claimants or this program to commission say a prospective cohort study that's intended to last say ten years or more. Short of that, I don't know -- one year, two years, five years -- those are -- that's a factor we need to consider very

carefully in engaging in, funding, participating or initiating any research. I would say in general, though, the longer a study takes, the less useful it is likely to be for compensation purposes.

Another issue to consider, and it's sort of in the same category, is targeted research versus research that kind of just increases the general body of scientific knowledge. Hopefully, research for -- or under the auspices of EEOICPA would also have some greater use.

I think one question, though, is do we want to get into research that has questionable, maybe very limited application to EEOICPA. There's no doubt that that research needs to be done. Whether or not this is the place for it, under this funding, is an issue to consider.

Potential effects of risk model modifications, well, as you know, a great deal of uncertainty -- uncertainty is factored into the IREP cancer risk models. In fact, in many claims, quite frankly, uncertainty is the major contributor to compensability. In those scenarios, although the best estimate of causation is the central estimate, which can -- actually some may be surprised

to hear this, but that can actually be one percent or less. At the 99th percentile credibility limit, the claim can be compensable.

Well, here's the rub. As we begin to incorporate study results such as results from occupational studies, that would have an effect on the uncertainty built into our risk models. The uncertainty is likely to be reduced. There's a domino effect there. As uncertainty is reduced, compensation is also likely to be reduced.

Again, I just want to note that it's often very difficult to ascertain the precise effects on probability of causation for every conceivable type of claim. It may be impossible, in some instances. There are just too many variables.

At this point, by the way, I just noticed I'm on slide 11, so I have some good news and bad news. The good news is I'm halfway done with the presentation. You're probably ahead of me here, the bad news is we've still got half to go.

I'm going to do some practical considerations for research. Let's just say that we have some hypothetical IREP change that appears it will be

claimant-favorable in some cases, claimant-unfavorable in some other cases. And by claimant-favorable, I'm finding that simply is increasing or decreasing probability of causation.

Well, the first issue to consider -- let's say we've got a completed study. We've evaluated the findings. Everybody's just gung ho, let's make this change. The first issue to consider is what is the precise effective date for the change. That's an arbitrary designation.

The second decision, exactly what claims will be subject to these changes? Is it all claims -- one option would be all claims filed after that arbitrarily-designated effective date. Does it apply to claims in the queue, so to speak, already filed, not yet subject to dose reconstruction? These are all issues to consider.

Now for the leukemia and thyroid change, there was no real issue there because there was no adverse effect on claimants. We simply applied it immediately to all claims, past and future. But as I said, that may turn out to have been an unusual circumstance. So we've got

-- we've got a very major decision to make about exactly how to implement changes as they come about. Let's say, for the sake of discussion -- and again, please don't read between the lines. We have not even come close to fully discussing or making a decision on these issues. Let's just say that we have some hypothetical change to some IREP cancer risk model. We designate a date. We determine that it's -- all claims filed after that date are subject to the change. Say this happens, over the course of this program, four, five, six, ten times. Well, the result of that will be multiple versions of IREP, each one frozen in time and each one subject to some specific subset of claims. That's one way to handle this. Maybe not the best way, it's certainly not the only way. But it's certainly doable from a technical point of view. It will require very careful attention to claims tracking procedures, but it's doable.

Let me give you a bit of an update on research topics. Take chronic lymphocytic leukemia, CLL, for one. Now this is a subject that we're very interested in. I have a personal interest in it, I might add. NIOSH's

Health-related Energy Research Branch -- the acronym many -- probably everyone here knows is HERB -- is currently conducting a multi-site leukemia case-controlled study. I don't recall off the top of my head what the expected completion date for that is, but they do intend to look at the CLL cases in that study. That's one avenue of research that's on the drawing board. And there will be others, as well.

The lung cancer smoking model I've already talked about a little bit. NCI has already adopted the change. Their model is now different from ours. We will look very carefully at that model.

But we're also interested in other issues related to the whole smoking/lung cancer issue, as well, such as when it's -- I've been asked about, a number of times, why do we say that -- that former -- why do we define a former smoker as quit five or more years ago, why -- you know, and why is -- does it have this or that effect on the risk model. There are a number of issues with the smoking and lung cancer model we intend to look at, and it's a high priority.

Age at exposure is another controversial topic. I know

one or more members of the Board, for example, were particularly concerned about that as we were developing the IREP program, before the Board was even constructed.

Well, I'm very pleased to note this morning that NIOSH's Health-related Energy Research Branch, HERB, will be conducting age at exposure workshops. That's on the drawing board. I believe their plan is to start that project before the end of this current fiscal year. In addition to that, HERB is also completing some of their existing studies, including exposure-based cohort studies.

And for those of you who may not know -- I'm sure everyone on the Board does, but there's a general assumption in the IREP risk models that the risk of inducing cancer decreases as age increases. That's one of the assumptions that the age at exposure workshops will look at, and the purpose includes re-evaluating that assumption, as well as the general procedures for establishing age at exposure and how they affect the risk models.

Going on to another probably -- I think it'd be fair to

categorize it as a very controversial topic, at least within the research world, are the DDREF distributions used in IREP. DDREF, as the Board knows, is an acronym for Dose and Dose Rate Effectiveness Factor. And to put it simply, that -- the DDREF takes into account the assumption that risk of inducing cancer is different at low doses and low dose rates compared to high doses and high dose rates. You may recall that most of our cancer models employ a dose -- an uncertainty -- excuse me, a probability distribution for DDREF that tends to fall mostly between one and two. Some have argued that it should be one. One has no effect, actually, on risk. Two reduces effect. Lower than one increases risk and so forth.

Well, that is a high priority topic for us. We will be extensively re-evaluating the DDREF distributions used in IREP. SENES-Oak Ridge, Incorporated will play a major role in that. We've just started talking with them about that. I can't really say any more at this point, but it is a high priority topic.

And also we have our own EEOICPA claims data. We're in the process of developing a separate epidemiological

database incorporating variables from the dose reconstruction process. We intend to utilize that, to the extent possible. I would say, though, that there are some limitations with that data related to the efficiency process. It's somewhat difficult to equate dose with risk based solely on the dose reconstruction data. But nonetheless, we certainly intend to utilize it to whatever extent we can.

We're anxious to begin work on other research topics, on collaborating and coordinating with HERB, working with SENES. And I might also mention, speaking of SENES, that Dave -- Dr. David Kocher's work on REFs has been submitted for publication to *Radiation Research*. SENES will be doing some more -- some additional research on REFs, particularly after publication and responding to comments and peer review.

I want to spend a little time now on discussing the current differences between NIOSH-IREP and NIH-IREP, which again is NCI's version of IREP.

The new NCI lung model is favorable in terms of increasing PC to some claimant profiles, unfavorable to other profiles. And I might add that lung model does

not apply to radon exposures. That has not been changed. The new NCI model takes into account age -- that's really the major change to the model, age at diagnosis and age at exposure. NIOSH-IREP does not. NCI, as you might guess, believes that the change they've made represents the best science available at the current time. Again, we intend to evaluate their model, and beyond that, I really have no other comment to make on -- additional comment to make on what NIOSH might do with the lung model at this point.

I do want to say, by the way, that this part of the presentation, the differences between the two IREP versions, come mostly from a list that Dr. Iulian Apostoaei -- is that right? -- that Dr. Iulian Apostoaei prepared for us. Iulian is with SENES.

In general, the new NCI lung model is much more complex. We do know that it apparent-- well, let me rephrase that. The new model appears to produce higher PC for smokers, higher probability of causation, and for people who were exposed in their twenties and diagnosed with cancer -- actually the slide shows that. It's really -- maybe Brian -- Brian Thomas of SENES is

here, as well. Maybe Brian can correct me if I'm wrong, but I think it's really 15 to 20 years after exposure.

It generally appears to produce lower PC for non-smokers and for females exposed later in life, as compared to NIOSH-IREP.

Another difference is, in the bone cancer model NCI has incorporated a new latency function for bone cancer. Their model now uses the latency function that is used for thyroid cancer. The thyroid cancer model is identical in both versions of IREP. NIOSH-IREP has not made that change. NCI, as I understand it, based that change on a reconsideration of some studies that were actually reported in BEIR V that suggested that bone cancer could be induced within two to four years of exposure.

Obviously that's another issue we intend to look at in NIOSH. I would say the NCI model in general appears that it will somewhat increase PC results for claims in which the diagnosis occurred within that shorter latency period.

The age limitation, there's nothing mysterious there.

NIOSH-IREP accepts minimum age of 15, reflecting the fact that our cohort is adult workers. NIH-IREP accepts all ages.

Skin cancer, NCI has no malignant melanoma model. NIOSH-IREP does. I frankly am not quite sure why they don't, and I'm not sure how malignant melanoma would be handled in NIH-IREP.

NIOSH-IREP adjusts -- well, both versions of IREP adjust for race and ethnicity for skin cancer. However, in our program claimants are required to identify one or more races, and those are in turn plugged into IREP. If they identify more than one race, we run the model under each race and take the highest PC. In NIH-IREP they have a category they call "all races". That's reportedly -- represents the entire U.S. population, so the effect of that, if race was unknown and say the individual was black, the PC result from running all races would be lower than running under the correct race -- than running the claim under the correct race. For whites it would be slightly -- slightly higher, though probably insignificantly higher.

Eye cancer, NIOSH-IREP has no specific model for eye cancer -- I'm sorry, NIOSH-IREP has an eye cancer model. NIH does not. Presumably if you're trying to run a case of eye cancer in NIH-IREP you'd use "Other and Ill-defined Sites" or possibly the nervous system model.

Cancers of other endocrine glands, well, both versions of IREP, IREP has a specific model for thyroid cancer and a specific model, for example, for pancreatic cancer. However, NIOSH-IREP has an "other endocrine glands" model. Endocrine glands are ductless, hormone-secreting glands that affect the metabolic process. In NIH-IREP there's no model for those other glands such as, for example, adrenal cancer. And at NIH-IREP, I think they would run that in the -- they would use the "Other and Ill-defined Sites" category, I believe.

Male breast cancer, NIOSH-IREP covers that. NIH-IREP does not. If you're going to run a male breast cancer case in NIH-IREP, I believe, again, you would have to use "Other and Ill-defined Sites".

Other digestive cancers, NIOSH-IREP has an "all digestive" model. NIH-IREP has an "other digestive"

model. But according to what -- Iulian sent me both models, produced the same exact PC, so there's effectively no -- no difference.

And finally, final difference would be dealing with multiple primary cancers. There's no procedure for that in NIH-IREP. As you know, under our probability of causation guidelines, EEOICPA provides for that; namely a mathematical equation that we actually used to do by hand, but I know some -- at some point in the program SENES created an online form for that that does it automatically.

And rounding third and heading for home here, we get to the summary. Some modifications seem to be relatively non-controversial, such as the thyroid and leukemia latency adjustments made earlier this year. Of course that was, again, an instance where we predetermined that there would be no decrease in PC. Other potential changes, such as lung cancer or the DDREF distribution, age at exposure, I would say substantially more significant. And we recognize that policy does play a role. In fact, one might argue that defining as likely as not is -- using PC at the 99th credibility limit is

as much, if not more, policy than science. But nonetheless, we certainly intend to use science to its fullest extent within the confines of whatever the policy happens to be at the time.

And we need to pay attention to practical issues, such as research time frames, whether or not research is applicable to the compensation program, how and when to apply changes and so forth.

Generally speaking, the more good quality data we accumulate, the less the uncertainty, and quite possibly the lower the PC. That's the domino effect.

It seems very likely -- to me, at least -- that many scientific findings are likely to cut both ways in terms of effect on PC. And in some cases, again due to the sheer number of variables in the models, it may be difficult if not impossible to exactly predict that effect for every potential claimant profile.

And finally, we're actively discussing research within NIOSH -- not just within OCAS, but with HERB, and we're planning research projects that hopefully will prove very relevant to EEOICPA.

And one final note, again, we all look forward to the

release of the BEIR VII report and we certainly intend to evaluate those findings when they're released for possible application to IREP.

And that concludes my presentation. Any questions?

DR. ZIEMER: Thank you very much, Russ. I think we'll defer questions at this time. If we -- we need to get to the public comment period -- very brief?

DR. MELIUS: Very brief.

DR. ZIEMER: Okay.

DR. MELIUS: It has nothing to do with public participation in this process.

The question I have is on the age at exposure workshops that are underway. Since that's a top-- I don't quite understand how the other branch is -- the other group is handling this and so forth, but certainly that ought -- ought to be something, since you're getting experts together, let's not have to do it twice and that we ought to consider some participation and so forth and so if you could just take that into account.

Second thing, I think that doing that kind of a workshop for the smoking issue might be a good way of handling that, too. Get some of the experts together,

be able to look at that as a way of sort of informing what are some of your policy choices that -- and what's the best way to proceed.

MR. HENSHAW: Thank you.

PUBLIC COMMENT

DR. ZIEMER: Thank you. I'd like to move us to the public comment period. We have folks who have been waiting and we have quite a few that wish to speak. We can come back to this if we need to, but I -- we're into the lunch hour. We need to honor those who've come here to address the Board.

Let me -- again, I want to remind those from the public, and particularly if you were not here yesterday, that this is an opportunity to publicly comment for the record on the program, the policies, concerns you might have. This is not a -- really a time to ask questions about any individual claim. If you have questions on individual claims, those should be directed privately to the NIOSH staff members. Also, our format here is not really one of a question and answer period. It's a statement period. If there are questions of broad interest to the Board and the

group, we may choose to respond to those, but right now we're simply looking for comments.

With those remarks in mind, and I'll take these in order except for cases where individuals have already commented to the Board, in which case I'm going to push you later in the schedule, Dolores Struckhausnider -- Struckhausnider? I may not be very good at pronouncing that one. Close enough, huh? Close enough for government work or some -- a former Mallinckrodt employee.

MS. STUCKENSCHNEIDER: (Off microphone) My name is Dolores Stuckenschneider.

UNIDENTIFIED: Pull that down --

MS. STUCKENSCHNEIDER: Okay. I worked at Destrehan Street and Weldon Springs for nine years. My file went to NIOSH in January of 2002 and I have kept in contact with them on an every-other-month basis. On September 2nd I was told that -- well, on July I was told my dose reconstruction was going to be completed by September. September I was told that there were unforeseen issues that had delayed it, and my dose reconstruction could take from 90 to 180 days.

Myself, I cannot understand why Mallinckrodt has been put on the back burner for two-plus years while other states are being compensated, and some have been given Special Exposure Cohort. Although we've had some attention from our legislatures, we've seen no real evidence of any action yet expediting or processing our claims.

When I attended the first meeting in St. Louis at the Millennium Hotel in July 26th, 2001, the representatives from Department of Labor and Department of Energy made the 14 people that attended feel very optimistic. This certainly has not played out that way.

Last night I was just able to read bits and pieces of the Mallinckrodt site profile. It said that the production office secretary/clerk -- which is me -- is presumed to have spent time in the office and assumed to have spent some time in the plant. This, and the fact that Weldon Springs is now a seven-story high tomb of radioactive waste called a tourist attraction on 45 acres and 1.5 million cubic yards of radioactive materials and chemicals are buried under clay, sand and

rock, is reasons for Mallinckrodt to qualify for the Special Exposure Cohort.

I don't believe that there is anyone that wasn't there can tell what the employees were exposed to and in what way. The fact that the buildings and the contents were buried should convince anyone that the whole place was contaminated.

Going back to my position as a clerk, our office was in the same building as the plant and was separated by two inside doors. The plant people came in, the office people went out. No one changed their clothing they were wearing. All the papers, badges, dictaphones that the people in the office worked with came directly from the plant. Desks had to be dusted every morning, and I'm told that the cafeteria floor in the main building used by plant and office workers had yellow dust on the floor and was wiped up several times during the day. This kind of makes you wonder what we ate.

The plant was approximately a city block from the main building, and I was one of two that relieved the switchboard operator in the main building for two breaks and lunch every other day. This walk back and

forth sometimes was unbearable. The odor out of the stacks was overwhelming. I felt sorry for the security guards that had to be outside all day, mainly because one of them was my husband's first cousin, now deceased. Whatever was coming out of the stacks seemed to be attacking nylon stockings, which after a time Mallinckrodt started reimbursing us for them. People that hear all of this wonder why we didn't know the dangers. I worked nine years for a company and I had no idea what was being done. I knew it had to do with uranium, but had no clue as to the dangers of this uranium or the presence of other chemicals and what it could do and did do to our bodies. We were not allowed to talk shop at work or at home. I had no reason not to trust Mallinckrodt and the Atomic Energy Commission. When I first read about the compensation and why it was being given, I felt anger and disappointment that our government had put us in harm's way without our knowledge or consent. My sister worked at Destrehan and Weldon and died at the age of 40. My dad worked at the main plant for over 48 years, died of lung cancer. Most of this I would like to e-mail or send to you.

Oh, I didn't say what I had. In 1985 I had breast cancer. In 1986 I had a metastasis to both my lungs and I was given less than a 40 percent chance of survival. That was 18 years ago. I still have to worry, though, because I have nodules on my lungs. The doctors say, you know, it's 95 percent sure that it's not cancer, and I've had the beryllium test, which came out negative. But he's -- I still think it's from the radiation 'cause the thoracic surgeon cannot tell me -- he's never seen it before.

The only other thing, I think it would be a terrible injustice if any more of these former workers passed away before they receive this compensation. Thanks.

DR. ZIEMER: Thank you very much, Dolores, and I believe you certainly can have that entered into your record. You work with the NIOSH people on that, as well.

MS. STUCKENSCHNEIDER: (Off microphone) (Inaudible).

DR. ZIEMER: Bob Leach, Mallinckrodt former employee?

MR. LEACH: My name is Bob Leach and I worked for the uranium division at Mallinckrodt -- well, I was with Mallinckrodt for 15 years and 13 of that was in the

uranium division. And when I was transferred over to plant four I was appalled at the conditions. That plant four was part of the Destrehan Street plant and it's where we made the bombs, so-called, or -- for the ingots. And when I went in there, the furnaces and stuff, there would be green salt, there would be liner material, it'd be all over the floor, just dusty as the dickens, and all we had was a dust mask.

Then many a times when we would put the bombs, after we had put everything in them and put them in the furnace, they would blow out. And then we would have to go in and clean up everything in there. And then when they got the electric furnaces in, why then we went to a bigger one. The smaller ones were around 200 to 300-pound -- we called them biscuits or ever what. And then when they went to the electric furnaces, we set off up to 3,000-pound ingots. And there again, many a times they would blow out. And we have had them not only blow out through the shell, but also come out through the bottom of the furnace and out into the area. And then of course we had to clean all that up again. And then mechanics had to go in and get the

furnace going again.
And we had one engineer there that sort of looked out for us. The lab would send down these experiments that they wanted to do in that furnace and he'd go over them, and he would send them back up. And he said if we did what you want to do, we would blow this place up, and he -- he looked out, which we were very thankful for.
But then later on I was transferred out to Weldon Springs and there again I was in what they called peanut heaven where we -- we brought the drums of uranium ore in, took the lids off and run them through the system, and then it went from there to the refineries to be made into green salt. But many a times the -- the dust collectors bags would break inside of them and then the mechanics would have to go in -- they would have to replace the bags. Then the operators would have to go in and clean them. And many a times the mechanics and the operators would be covered with this uranium dust that had been vacuumed up.
And -- well, there's just so many things that was not

taken care of, and many of us foremen -- well, not only the foremen, but the operators, we would work as many as 70-some hours a week during the summer when they were operating seven days a week, and through the week they would operate 12 hours a day, and we had to -- especially if any of them was on vacation, foreman or operator, that area had to be covered. And you might say well, you can't work 70-some hours a week, but believe me, we did, Saturdays and Sundays and all. And to me, this is one reason why, with all these different variables, that there is no way in God's world that they are going to set up an accurate exposure record for any of these systems, because they were not there. We were not monitored like we should -- we did have film badges, but this went on and on, all the time. And when we would make these 3,000-pound ingots, they would be laying out in the open. They would tell us that -- oh, you can sit on that; said any radiation you would get would be gone out of your body within a week. Well, now they know that is not so. So we -- we all had our jobs, and we had families to support, and that's basically why most of us stayed

there.
And there was just many, many times like this. In all due respect to all of you that's working on this, there is no way you're going to get an accurate account of the radiation and exposure that the operators, the foremen and all had during these here 12 or 13 years. And if any of you -- anybody thinks that we were getting rich, I was foreman for several years and when I was terminated I was making $4.13 an hour, $752 a month. And just coincidentally -- and it's strictly a coincidence -- but Mallinckrodt let me go two months before I was eligible for a pension. Thank you.

DR. ZIEMER: Thank you, Bob, for your remarks. Next we go to Kay Dray (sic).

MS. DREY: Drey.

DR. ZIEMER: Drey? D-r-e-y, yes, Nuclear Information and Resource Service.

MS. DREY: I always tell myself to be organized, but I never can. My name is Kay Drey. First I would like to thank you for holding your meeting here in St. Louis. For many years I have sort of boasted that we have the oldest radioactive waste of the atomic age.

As you may know, the Mallinckrodt Chemical Works purified all the uranium that went into the world's first self-sustaining nuclear chain reaction in the Ferme reactor below the football field at the University of Chicago in December, 1942. And some of the radioactive waste from that historic experiment, the birth of the atomic age, is still just a few miles north of here.

Mallinckrodt processed uranium and thorium for nuclear weapons purposes for about 25 years in metropolitan St. Louis. Approximately three million cubic yards of radioactive waste was generated, and no safe, permanent technology or location has yet been found to isolate the first cupful of that waste.

I made my first public speech in November, 1974 against the proposal to build Missouri's first public -- first nuclear power plant. That was 29 years ago. At that time I first began learning about the hazards of uranium mill tailings, and was relieved to think that those wastes were not a part of our local problem. It was a great shock to learn then in 1978 that we had uranium tailings here in St. Louis from some of the

richest, most radioactive ore in the world.
During World War II the Atomic Energy Commission was willing to purchase any ore that contained even just one tenth of one percent uranium. The Belgian Congo pitchblende that we processed here was 60 to 65 percent pure.
Over the years since then I have met many fine people who have told me about working at the Mallinckrodt Chemical Works, and about the work place hazards they faced. It is only because of the sensitivity, hard work -- and as I often say to people, the brilliance of Denise Brock, and because of the enactment by Congress of the long-overdue commitment to compensate former nuclear weapons workers or their survivors, and because of the efforts of your Board, of NIOSH and other agencies, that perhaps justice and fairness will finally prevail.
The ultimate irony, of course, is that except for America's dropping of the Hiroshima and Nagasaki bombs on Japan in 1945, no nation, fortunately, has exploded any nuclear weapons as an act of war. By having produced and tested nuclear weapons in our nation,

however, we have been poisoning our own rivers, our air, our land and our living creatures. Or to quote the title of an extraordinary book from 1982, we have been killing our own.

I literally have accumulated a houseful of books and have carefully filed documents and correspondence about the hazards of radiation, nuclear power and nuclear weapons. These documents make it undeniably clear that many scientists, physicians and engineers and political leaders have long known that radiation is harmful.

But no one told the nuclear weapons workers. In fact, no one was even allowed to use the words "uranium" or "radiation".

I have brought a book with me this morning published as a report in 1945, a month after World War II ended, in which the author, Princeton professor Henry Smyth says, quote -- this is from 1945 -- "It had been known for a long time that radioactive materials were dangerous. They give off very penetrating radiations, gamma rays, which are much like X-rays in the physiological effects. They also give off beta and alpha rays, which, although less penetrating, can still be

dangerous. Quite apart from its radioactive properties, uranium is poisonous chemically." His book is entitled *Atomic Energy for Military Purposes*. Our decision-makers have known about the hazards of radiation and of natural and enriched and so-called depleted uranium. But they were not telling us back then, and they are only reluctantly beginning to level with us today. But no matter to what extent the experts may or may not have known of and concealed the hazards of radiation, they did not know -- they did not know -- how to accurately monitor the radioactivity in the air, water or soil, nor the contamination in the work place on floors, ceilings, walls and machinery in the 1940's, '50's or even in some cases currently. And many of the personnel dosimeters, whole body counters and other gauges were inadequate then and are today, particularly for alpha emitters. That is, for most of the predominant uranium and thorium materials processed at the Mallinckrodt facilities at downtown, Weldon Spring and Hematite, and their daughter products, including some for which no monitoring was performed, such as protactinium, polonium and radioactive lead.

The extremely hazardous beta-emitting daughter of uranium 235 -- that is actinium 227 -- was also present at the downtown Mallinckrodt plant because of the Belgian Congo pitchblende, and radon 219, which is not normally even detectable where American ore is processed.

A laborer who is far too ill to attend your meeting here today told me that after spending days -- I can't remember, it could have been weeks -- digging in a trench at the downtown Mallinckrodt plant just two years ago as a part of the cleanup of the site, someone told him that the gamma readings were not ten to 20 counts per minute, as in nature, but were 1,500,000 counts per minute.

I have submitted to you three pamphlets today that I helped write for the Nuclear Information and Resource Service, a Washington, D.C.-based non-profit organization for which I serve on the board, and also a copy of comments I presented nine years ago, in part about our historic Mallinckrodt wastes. My request to you today is that you will consider including in your findings the observation that our world has amassed

more than 60 years of radioactive waste from the atomic age, for which no safe, permanent location or technology has been found. And that for every watt of nuclear power generated, and for every nuclear bomb fabricated, human lives and the environment may be tragically compromised, today and far into the future. Thank you.

DR. ZIEMER: Thank you very much. Next, James Mitulski, United Nuclear Weapons Worker.

MR. MITULSKI: (Off microphone) (Inaudible) yesterday, you want me to go ahead (Inaudible)?

DR. ZIEMER: That's right. Go ahead, that's fine.

MR. MITULSKI: I'd just like to speak to the report given earlier by -- I -- Dr. Jim --

UNIDENTIFIED: Neton.

MR. MITULSKI: Okay. Sorry. As regards to using the company's data, I would agree with you, there's no reason to assume that the company -- company supervisors did not -- were not people of integrity. But there's also no reason to assume that they were people of truth. You know, not everybody is good or bad, and not everybody has pure or impure motives.

People sometimes say things to keep their job. So even though I think that it might be one place to find data, I think you also need to go to the people that were in the plants. I'd just like to give you a couple of examples.

I told you yesterday my dad basically worked with uranium -- well, with radioactive materials at Weldon Springs. When he first got out there, they had no instrument for testing thorium. And they must have gotten something in from Oak Ridge, and they would test him and they's say he was too high and they'd make him go take a shower. And then he'd come back and they'd say you're still too high, go take another shower. Then he'd come back and they'd say you're still too high, go take another shower, until they got him to a point where his readings were acceptable. And then they would write it down. So obviously he was exposed to more than he should have been, but they did maintain a good record that his readings were acceptable.

Another situation that occurred with Dad was he was in a explosion in a plant that processed -- or that melted down uranium, basically -- scraps and the like. And

after this explosion -- first of all, he concentrated on saving another man's life that was in the explosion. He concentrated on evacuating the plant, and then after he was sure everybody was safe, he went to get tested at the hospital himself -- which was about two hours later, after he'd sent everybody else to the hospital. While he was gone, they burnt all of his clothes. I don't think they did that because they thought it would be a good joke to play on him. I think they thought it was dangerous; his clothes were radioactive.

He got to the hospital. The hospital didn't want to admit him because they were afraid he was radioactive, and they did some testing on him, like for shock and sound like and the like, and then they released him. He went back to the company, Weldon Springs. They sat him down in front of a whole group of people. They had all these microphones on and they said well, why did that -- that furnace explode? One of the gentleman that was in the room -- or in the factory with Dad when the furnace exploded said well, now why are you worried? Jim's been telling you for months if --

unless you did something, the furnace was going to explode. They turned off the machines and the interview was over.

Now I don't know what went onto a report. I do know that when I looked it up in the -- on -- in the *Globe* -- well, *Post* and *Globe*, 1960, July 15th, basically it said there was a minor gas explosion, and that's all they said. So I don't know what went in the company records.

I do know, too, that I -- I think there's more than one guy here who could probably tell you that they told everybody just drink beer on your way home, it'll rinse everything out. Did you hear that?

UNIDENTIFIED: Right.

MR. MITULSKI: You know, they told them a lot of misinformation. Now some of -- some things they may have thought were true, but I don't really believe that the people in charge thought that drinking beer would wash out radioactivity. So not everybody was honest. And Dad talks about hauling pallets, I don't know how many pounds of uranium. You could only -- you know, just exposed, and you couldn't get within so many feet

of another pallet because it would cause a criticality. You -- everybody had to go through the factory the same way. Obviously these people were exposed to a lot of dangerous stuff.

And I do think that in order to get a valid assessment of what's going on, you have to talk to these men, too. Because, like I said, you know, there -- there -- people -- their jobs were at stake. I can't imagine a supervisor writing down I did it all wrong and putting it in a file, unless he had a supervisor who did it for him. So not all these reports were probably valid, and I think the only way to check out the validity of what the company says is to bounce it off what the laborers are saying, and then try to arrive at the truth. Thanks.

DR. ZIEMER: Thank you, James. Next, Mark -- is that Buening?

MR. BRUENING: (Off microphone) Bruening.

DR. ZIEMER: Bruening. Okay. Thank you. Mark Bruening, United Nuclear Weapons Worker, Mallinckrodt.

MR. BRUENING: Yes, my name is Bruening, B-r-u-e-n-i-n-g, good German.

Anyway, Father Mitulski just stated that there was statements made for these people to drink beer, it would flush out your system. Well, I had 17 years with Mallinckrodt at both places. And like I said, I'm German. I love my beer, and it did not flush it out because I -- it'll be two years this December, I had colon cancer, so that knocks that theory in the head. And another thing, we had a -- Mallinckrodt did not think much of their employees. We moved -- I got transferred out to Weldon Springs in '57, in February. I moved my family from Illinois to O'Fallon, Missouri in the end of May. I'm going to say maybe it was a month, maybe two months, I got sick. But I went to work. And then one morning I had to go to the dispensary. I couldn't stand the pain.

Well, the nurse down there diagnosed I had kidney stones. And I don't know if any of you has ever had kidney stones, buddy, I don't wish them on nobody. So anyway, the nurse called up my boss and said he has to go to the hospital. So I go back up to the department. Who drives me home? One of my coworkers from another department. We get home -- my wife didn't drive -- and

this friend said Mark, I'm going to take you to the hospital. I went to the hospital at St. Charles. I never heard a word from anybody at Mallinckrodt from the higher-ups. I didn't even get a damned get well card from them, 'cause I think they -- well, I'm not going to say it.

But anyway, getting back -- also we had a meeting with Mr. Aikens. Now I've told you, I've had my cancer. We had a meeting with -- who's he -- is he a senator?

UNIDENTIFIED: (Inaudible)

MR. BRUENING: Oh, a representative, at Troy about -- oh, four or five months ago. And my question to him was Mr. Aikens, I'd like to know how come we have to wait anywhere from months to years to get compensated for the cancer that we got from working for the United States government. The illegal immigrants come across that border and right away, where do they get their money to live? Where do they live? The only answer I got from him was -- well, he said, first thing they do, they run to the hospital to the emergency room. He said once they're there, they can't get rid of them. And I don't think it's right.

And then, when was it, early this summer, Senator Bond, he appropriated I don't know how many millions of dollars for lead poisoning. And I would like to know -- and I can't find out. Anybody that has a lead poisoning, do they have to wait like we do to get compensated? I don't know. I wish somebody could tell me. Nobody knows.

And it wasn't too long after that, Mr. Bond appropriated $1.5 million for one of the cities to build a street through their town. But we have to wait for months and years to get compensated, and we can't get nothing out of him -- can we, Denise? Huh? I don't care who's sitting there. Is he there? Is he there? Well, how -- why? Why do we have to wait?

UNIDENTIFIED: (Off microphone) Well, that's why we're here because, first of all, the Act was passed in 2000 --

MR. BRUENING: That's right.

UNIDENTIFIED: -- and the implementation for that, we're having some problems and --

MR. BRUENING: Why, it sure --

UNIDENTIFIED: -- (Inaudible) but those people waited

for (Inaudible) had to wait some time. They probably don't have to wait as long as (Inaudible).

MR. BRUENING: That's what I figured. Well, anyway, that's my argument. Thank you.

DR. ZIEMER: Thank you. I'm having a lot of difficulty on the next one here, could that be a -- is it a Don?

MR. ELLIOTT: Dan?

DR. ZIEMER: Dan or Don --

UNIDENTIFIED: Is it Don Camstrader?

DR. ZIEMER: Yes, okay.

MR. CAMSTRADER: My name is Don Camstrader and I worked at Weldon Springs from 1957 till 1966. I worked the first two years as an operator and the last seven years as a pipe fitter. And in the early years, it was -- it was pretty primitive. Everything was new and nothing worked right. And so we would -- we'd cook off the uranium and when the uranium would be finished, we had big vacuum hoses that were stainless steel, of course, to carry the product. Usually about the time we'd stick them in there, the system would go down, you know. So you'd pull them back out and you'd -- you'd bring in a 55-gallon drum, put a little hood over and

stick a house vacuum on it and scoop this thing out with feed scoops. And it was hot work, and the only thing we had to wear was asbestos gloves and little aluminum face masks that only had a little cotton filter in them.

When you'd get finished with sucking a pot out, why you'd -- you'd take your mask off and you'd see on anybody there was uranium oxide around your face here and close to your nose, and you didn't think anything of it. You went in and -- and washed your face off and went back to work.

But those kind of things in those days, like I say, everything broke down more than it ran. When they finally did get things going pretty good, well, I had enough time in that I could get out of that job, so I got into one of the better jobs. And they all had their problems, but the -- the building itself, for the most part, we kept pretty clean because everything could be hosed down and every place where it was hosed was into a retaining area so that everything that did wash down was recovered.

But then when I went into the fitters and there wasn't

a building or office or anything else, I don't believe, at the plant that I didn't go into at least once, you know, and I worked in all of them. Some of them were really rough. Some of them were really easy. But in one of the plants in particular, the green salt plant, we had a real bad breakdown one time. We had to go in and fix something -- I can't remember just exactly what it was -- we had to put on a complete rubber suit with rubber boots, rubber gloves and a hood, and then you had to put an air line mask on. Well, somebody had to sit by the -- to watch this thing to make sure you maintained the right air pressure so -- and I know it wasn't 20 minutes or so and -- it was tough trying to do a job with them bulky rubber gloves, this big suit on. But you got in there and -- and when I got out and got to a clear area where I could undress again, I could pour water out of my boots, I'd sweat that much while I was inside that suit. So that just kind of shows you what -- what kind of job that was.

Another job, two of us worked on and it was about a week-long job and about the third day I -- when we got ready to go to work, I grabbed him, I said come on,

let's get over and get that job done. And he said I can't go with you. And I said why can't you? He said I came up high -- hot yesterday. So I said what are you talking about? He said yeah. He said they told me I was too hot, I couldn't work on that job. I said well, hell, we was working together. You know, both of us were on the same job. So I went and checked and they said well, no, you're not hot, so I went back on the job, got another guy and we went in -- and this kind of shows you how the badges themselves were -- like I say, there was no way that he could have came up any hotter than I was because we were both doing the same job and doing it together.

And as far as Father Jim talking a while ago about how different people were out there, we had a lot of really good people. I mean we enjoyed each other. It was like a big family. And one of the first foremen I had was Jim Mitulski. And Jim, to this day, I feel, is the greatest man I ever met. He's a -- if Jim told you something and you got in trouble for it, and you told them Jim told me, you didn't have to worry about him not saying that, you know -- if he said it, you could

take it to the bank. That's the kind of guy he is. And I thank you.

DR. ZIEMER: Thank you very much. This may be either Norbert or Herbert, and again I'm having a little trouble --

MR. HIER: Hier?

DR. ZIEMER: Yes.

MR. HIER: I --

DR. ZIEMER: What is the correct name? I --

MR. HIER: Norbert --

DR. ZIEMER: Norbert.

MR. HIER: -- Hier. I also worked with Don here, or I started in the dreaded pot room, which is -- I think everybody got a taste of that thing when we were scooping uranium out with scoops and had a little bitty respirator, which I found out later that -- in my different jobs, that it's not even approved for cutting grass, hardly, much less scooping uranium. And the equipment we had in those days, when I first started there, was nothing. That's -- in fact, that's the only thing we had.

And then I went into the pipe fitters, which -- the

jobs, too, which the people don't even recognize what all the things that we went through with tanks running over and breathing this toxic fumes, and all they would tell you is don't put any -- we didn't put any special equipment on or anything, just go in and get it shut off, you know, clean it up.

And the big thing is, simply -- just like the smokers, you know. Smokers are warned on the cigarette package that it's bad for their health and all this stuff. We weren't told nothing. All we were told in safety meetings is be careful, you know.

And all the exposure we had to different things -- not just the radiation. We were exposed to asbestos, which has been known to be a deadly thing, and we used that stuff like it was going out of style, and the government doesn't even recognize that. And I went to schooling on -- had to take some schooling on the next job I was on, as a maintenance worker, and this program is -- like I say, the government doesn't even recognize this -- and I don't think any part of maintenance, what you work on, the furnaces, pipes -- and we did -- the pipe fitters did our own insulating, and we used the

friable asbestos like it was going out of style, you know, so I --

I don't understand why, with our compensation, that -- now I have cancer of the bladder and also of the colon, and I've had 11 major surgeries so far. So I -- you know, I can't blame the people that -- maybe that I worked for if they didn't know any better, but somebody surely knew that it was not a very good thing. So like I say, if we were warned, maybe it would have been a different situation. Thank you.

DR. ZIEMER: Thank you. Then -- is it Tom -- is it Hogan?

MR. HORGAN: Horgan.

DR. ZIEMER: Horgan -- Tom -- oh, Horgan, right, and Tom's from Washington, D.C.

MR. HORGAN: Thank -- is this on? Thank you. I just want to -- I'm Tom Horgan. I'm with Senator Bond's office, the Health Education Labor Pension subcommittee on aging. Once again, I want to thank all of you for coming. I have found this very helpful. As a staff member of the committee that has legislative oversight for DOL and NIOSH, I want to convey to you that I

believe that the scientific guidance and advice that the committee provides is very important, especially as we try to figure out -- work out some of the kinks in the legislation and the implementation.

The legislation set this Board up for a reason, and that was to get input. Now while I know that many of you had not had much time to go through the Mallinckrodt site profile, I would like to get, if at all possible, individual feedback from every Board member regarding the particular site profile. I don't know if that's possible, but it would be very helpful. I am particularly interested in getting feedback from the Board members who have scientific and medical knowledge. After sitting through two days, again, I have found it very helpful, but I'd like to note a few things.

Now while I do not have the expertise to comment on the science that went into the site profile, and -- I am somewhat concerned about the lack of records for workers who worked at the site prior to 1948. Also I would encourage NIOSH and the Board to get as much scientific expert advice from people who have worked in

this area over the years, as this living document or site profile develops. I think that worker feedback should also be explored. I believe that the perceived and actual credibility of the site profile will depend on this.

I would also encourage NIOSH to do whatever they can to finalize the SEC rule in the not-too-distant future. As you can see, we have a lot of frustrated people down here.

But that being said, I want to thank Larry and NIOSH for holding this meeting here in town and giving people a chance to say what's on their minds. And that being also said, I want to say on behalf of Senator Bond, once again, I thank all of you for coming into town here to hold your meeting and provide a public forum, and I hope that you have enjoyed your stay in St. Louis. Thank you.

DR. ZIEMER: Thank you, Tom, for those words. Let's go now to Donna -- it looks like Edmond?

MS. ERLMANN: (Inaudible)

DR. ZIEMER: Elmond, okay. Thank you, Donna.

MS. ERLMANN: I'm speaking on behalf of my father. He

was too ill to be here today, but he did work at both the Destrehan plant and also at Weldon Spring for a number of years, and this is his statement, not mine. He was a strong --

(Reading) I was a strong, healthy man when I went to work for Mallinckrodt, but the years after I left my troubles began. First I had a heart attack, then gall bladder disease. I've had clots in my legs, neuropathy in my feet. They hurt so bad that I could hardly do my new job. I've had quadruple bypass. I've been operated on for cancer of the colon and they've taken several feet of my colon. I've spent the last 30 years of my life paying hospital bills, doctor bills and medicine bills. And I'm convinced that some, if not all, of my problems were caused by my employment at Mallinckrodt.

I never told anyone about these things because everything was supposed to be kept secret. But when I heard some of the stories that the other workers were telling, I thought it was time to speak up.

I worked in the breakdown area picking up shells with a hoist. We would take the cap off with the shell laying

in a cradle and cut the limestone walls of the shell out with a jackhammer as far down to the derby as we could. Then we would up-end the shell with a hoist and hammer on the sides and the bottom of the -- and break the bottom of the shell until the derby or ingot of uranium fell out.

The next operation was to break the lime off with hammers until you had a fairly clean derby, about seven or eight inches in diameter, five inches high, weighing about 95 pounds. Some derbies had a black oxide formed on the bottom, and when we would slide them on a metal roller conveyor, they would catch fire. If you didn't clean it off, it would burn all day.

I turned in a suggestion for an easier way to clean the shells, because they were never cleaned good enough. The most they paid was $25. My suggestion must have been a pretty good one because I got $75.

I don't recall how long I was on that job, but following that I was put over in the refinery operating the metal dissolver. It was a dangerous job, working with scrap uranium from the blowouts. That's a fine material which is very dangerous because it dissolves

very fast. The larger chunks are solid and dissolve slower. Fork truck drivers would bring predetermined loads to me on skids and I would load them into a stainless steel basket in a tank of about 10,000 gallons. I would close the lid and start the acid spraying over it.

Too much fine material would cause a reaction. The lid would raise up and the fire would puff out. If that ever happened, I was supposed to open the flood valve with water and it would sound an alarm to evacuate the refinery.

One Saturday morning they set the material up for me, and I told my lead man it was too much fine stuff at one time. He said run it. When the lid raised up four inches and started belching out fire, I was scared to death. I turned off the acid, went down the ladder and flooded it. My lead man came running out and said what the hell are you doing? I said I'm just doing what I'm supposed to do. It turned out my boss was off and the wrong material had been set out. No one communicated this to me, so I didn't feel I was at fault. I had been trying to get into the machine shop, so I didn't

stay on that job much longer.
Finally after several years experience running various lathes and grinders and milling machines, I learned to read a micrometer and got into the machine shop. I worked the 4:00 to 12:00 shift most of the time, so I got a lot of experience in the field working with some good buddies -- Roger Aubachon*, Hank Pedulski*, Joe Menteer*, Frank Bogner*, Les White and Charlie Sheeley*. We worked together tearing down blown furnaces, which were very hot. Sometimes we'd only stay in there for 15 minutes, sometimes a half-hour. Other times we would work on dust collectors, cleaning the bags and putting in new ones. I cannot say that anyone ever checked them out before we worked on them, but I believe they were very hot. We would often spend a couple of hours in the dust collectors.
I remember when they drilled holes throughout the plant and told everyone it was for termites. I believe now, as I did then, that it was to check radiation levels because it was no longer safe. I believe that's why they built the Weldon Spring plant.
I did not volunteer to go there because of the 75-mile

round trip every day. The time came when I was forced to go, and I lost my seniority, so I had to go back into the manufacturing division because there were enough people in the machine shop.

This time I went to work in the green salt plant. I had to operate the fluid beds on the very top floor. There were two vessels where they forced hydrogen to react with orange oxide to turn it into brown oxide. The heat was terrible, 145 degrees. The brown oxide was mixed with hydrofluoric acid into three different screws, each one about 25 to 30-foot long. If the acid was added too fast, it would bridge the screw. There were times -- sometimes it was so bad the hydraulic pressure could not turn the screw. Then there were other times when the ribbons in the screw would break and the whole bank of furnaces would be shut down and the screw would have to be pulled out. It was a lot of work, very costly.

A couple of good panel board operators could control the green salt by speeding up or slowing down the screws, but there were always hazardous jobs. You always wore gloves, hard hats and goggles. That's

ludicrous.
When I went back to the machine shop I was exposed to many other types of contaminations working on the -- I guess they're bullard lathes. They would cut a curl off of a 4,000-pound ingot of uranium. The chips would fall off into a basin around the chuck, which was continually being flushed with water-soluble oil. But it would still ignite and turn cherry red.
I changed dies in the extrusion presses. They would be burned black with a hard crust on them. I would straighten the mandrels and they would be black. It seems to me that anything in contact with uranium a certain length of time would turn black, and I think that the black oxide that forms is very hot.
We were always packing pumps, changing and repairing machinery in areas where we had to have rubber boots, gloves and goggles on. I remember going to take out the packing on a few pumps, which was only referred to as "the place across the street". I believe this was down at Destrehan. When we went through we had to neutralize our tools that we had used and throw them in a barrel. After that, they were put on a raffinate

truck and hauled out to the airport dump. It must have been really potent stuff.

I know some of these observations and opinions may not be completely accurate, but I believe they should be told. I believe it's possible that the airplanes flying over the raffinate dump at the airport may have been picking up radiation, and that that is why they wanted to move the operations to Illinois. That's probably a little exaggerated, but I've had -- I've thought about this for years.

One thing I do want to bring up is my concern for years they've hauled that waste through St. Louis with no thought for public safety. They tore down -- then they tore down the Destrehan plant, hauled it out Highway 70 to Highway 94 and dumped it into the quarry. Then they cleaned up the Brown Road site and hauled it out. The next site was the Pitter* Lake that had some good material on the bottom. Someone wanted to reclaim it and they wanted to pump the water into the Missouri River. Somehow the people in St. Charles County got wise and would not allow it for fear of contamination. I think the DOE knew they were in trouble for dumping

in the quarry. Finally they made a place on the Weldon Spring site for storing the waste. They built a new road from the quarry to the storage site, eliminating the well-traveled Highway 94 route. I don't know what all is completed, but I think they finally monitored the water and pumped it into the Missouri River.

I believe the workers and the public have had the wool pulled over their eyes for years. Now, after 50 years, they want the workers -- who are 50 to 60 percent deceased -- to go by their rules and regulations for compensation.

I worked hard as an employee of Mallinckrodt Chemical Company, as did many other people. All my illnesses began a few years after I was laid off. Four years ago I was placed on a ventilator to breathe for me. It's been a long road to recovery and I'm still quite debilitated. I cannot prove that this was all caused by radiation exposure, but I have my guess. Without excellent care, I would not be alive to tell you about it.

The Department of Energy has spent $900 million covering up their mistakes at the Weldon Spring site,

and I think it's time that they take care of their workers.

DR. ZIEMER: Thank you, Donna, for your comments on behalf of your father. Next we have Denise Brock. Denise.

MS. BROCK: Can I raise this? How do you raise this?

(Pause)

I'm loud, loud and proud. First I would again like to thank NIOSH, ORAU and the Board for coming to St. Louis. I would also like to state for the record that I am ecstatic that some claims have been able to be dose reconstructed prior to the TBD or the site profile. I'm happy to see this tremendous progress. I would also like to state that since the TBD was just finished, and this is not a forum that will allow for time and space element to accommodate the full amount of claimants that we have, or interested parties for Q and A to -- or comment, that I would like to respectfully request NIOSH, ORAU or someone to come back to St. Louis as a special meeting that would allow for such communication.

I do have several other questions to raise, as well as

some comments. My first comment actually would be in reference to outreach, and I'm sure most of you know that -- and this goes to the Board, as well as representatives from DOE and DOL -- we do have a United Nuclear Weapons Workers here. It is an established worker advocacy group, and it would seem efficient to utilize this group in your efforts. We would be more than happy to share any information we have, or as I've stated in the past, I do have access to the UAW and some retirees and several workers.

And to the site profile, either under the contents of documents with Dr. Neton's presentation or even on the TBD, on page 50, if I read it correctly, I understand that there's statements to the effect that prior to 1948 documents and/or records are spotty. I thought I saw that even statements were stating that there were -- or are such great variabilities between workers and jobs that dose reconstruction is not feasible. And I'm wondering why you would use surrogate coworker data. I mean it sounds to me that that would be a Special Exposure Cohort if it's stating that it's not feasible. Which brings me to my next comment. I don't understand

how you could state that Mallinckrodt wouldn't even be considered for a Special Exposure Cohort status, even during that specific time frame where the records are spotty, when the proposed rule has not even yet been finalized. I mean I'm not understanding that, but I'm assuming the criteria is something that we don't even know what we have to meet as of yet. And so that sort of seems to me like you're putting the cart before the horse. I feel to attempt to dose reconstruct with a lack of records and impute numbers, and then decide if it doesn't work to SEC, it seems to me a duplication of efforts and a waste of time that these workers and survivors do not have.

And for the record, Mallinckrodt claimants deserve the same consideration and benefit of the doubt that the other four Special Exposure Cohorts received.

And still continuing on the contents of documents, as far as references -- and I don't know if you can answer this for me or not, I'm just curious. As far as references, was the Hanson Blatz-Eisenbud memo ever obtained and -- and used with that? I didn't see it as a reference.

And also I noticed that when I was looking through that, there was no -- unless I'm incorrect, there was no actinium or Ac-227 listed as part of the -- and I know that was also part of the residue I believe found at the airport site. And I seen something about history on that off-site on page -- I believe it was page four.

One page three on presentation, on introduction, '59 to '95 residual activity, I'm curious and I'm just questioning, what about now? The Destrehan Street site I understand still has huge piles of uranium out there that they are dumping soil and gravel on top of. And I've also talked with elevator constructors who are now -- the way I understand it, in plant six, doing something with elevators or elevator constructors, so I'm curious. They're not wearing protective gear, and I'm not a scientist or a health physicist, but my concern would be that my construction or my elevator workers are in there with no sort of protective gear whatsoever. Does this not have residual activity? I mean is that gone? Does that not have a half-life? I even have a laborer, a roofer, that called me and

he's pulling a roof off of something, and I don't know if that's something for -- for anyone here to answer or if I need to go somewhere else on that, but that was a concern.

And the other thing I wanted to ask was I understand that plant six refinery was constructed to process pitchblende, which contained significant amounts of radium. And because this radium gives off gamma rays, which I understand to be very penetrating, is that also being considered with the plant six workers? I mean is it possible to -- to consider that or expedite that as -- without the TBD? I guess when that's done, it doesn't make a difference. I don't know.

DR. ZIEMER: You have a number of questions there, Denise, that perhaps the staff can follow up on. I don't know if we can answer all those now. For example, the Hanson Blatz-Eisenbud memo, perhaps Jim can check on that. Some of the other questions, I --

MS. BROCK: Okay, e-mail's fine, whatever.

DR. ZIEMER: -- have been heard and you can --

MS. BROCK: Okay, and thank you again.

DR. ZIEMER: -- be in contact. Right. Thank you very

much for those comments and your continued interest in the program.

And then last, but probably not least -- oh, I've got -- did I miss one? I have Richard Miller down, but Jim, are you wanting to comment? Okay, Jim Werner.

MR. WERNER: Thank you, Chairman --

DR. ZIEMER: And identify for the record, Jim.

MR. WERNER: Sure. My name is Jim Werner, W-e-r-n-e-r, with Missouri Department of Natural Resources, and I also want to thank the committee for coming to our fair city and Dr. Ziemer -- Paul, my old friend, come back -- and all of you for your service, 'cause I know how these advisory committees take a lot of work. But I assure you, it's very important work you're doing and very important you've come here for our sites.

The main message I wanted to give to the committee is to offer the technical resources available from the Department of Natural Resources. We have had staff out at various sites for decades reviewing technical documents and have a lot of expertise built up over the years. And so I wanted to make that offer to you.

I have reviewed the Technical Basis Document, not read

it in detail yet. And first of all, to the ORAU folks who did it, it's a -- obviously reflects an enormous effort. In fact, I think many of you on the panel know me from working on the issue for 20 years outside of my DNR job now. I think you can see that it may mean something that, from my perspective, it's probably the most comprehensive document I've ever seen on the site. So I congratulate you for that.

But not speaking on behalf of DNR, though, I would say that it still reflects, as many of you have seen, a lot of uncertainty, a lot of assumptions had to be filled in for the dose reconstruction. And you know, there's a time element here that's important. I would urge you to consider quickly making use of the technical resources of the Department of Natural Resources, but also any good manager knows sometimes you can't just work harder and work faster, you need to work smarter. And obviously within the statute there is a basis for establishing the special cohorts, and I appreciate that the rule is not out yet, but that due consideration be given to establishing a special cohort here, given the uncertainties in the data here.

One basic observation in reviewing the site basis document is the lack of recognition to the integrated way that the site operated. I think you've heard abundant evidence from workers here, and the ORAU folks are likely aware of it, but it just really wasn't reflected in the document that the three sites really -- Destrehan Street, Weldon Spring, as well as, to some extent, Hematite -- worked as an integrated whole with workers shuttling back and forth between them. And the other source of documentation that I would urge you to consider is the Sutelind* Archive material where there's significant files on what they regard as MCW activities, and the MCW -- the Mallinckrodt Chemical Works -- really looks at the whole operating entity as an integrated whole, working, you know, together with workers shuttling back and forth. And I chatted, Paul, before with you about that the work of the committee and the exposure assessment involves following individual workers, and I appreciate that's an appropriate way to work and it's logical managerial, but some recognition to the integrated way the place is operated would be appropriate for -- for other health

effects.
The other technical resource that would be available is secondary documentation. I noted that you cited my document linking legacies that we spent almost ten years researching it. There's a lot of background documentation on linking legacies that might be helpful to you in putting together that.
And lastly, in addition to the operating facilities, the Westlake facility has turned out to be a knottier problem than we first found because of the protactinium problem, which obviously a different radiological imprint than others.
Then just in conclusion, I urge you to not just work smarter and harder, but you know, consider all the technical resources available to you, and we offer our -- our technical ability on -- and it -- again, that has to be dealt with quickly. Actually our technical staff may be disbanded to some extent. We've lost all funding from the Department of Energy to maintain any oversight role, so all the decades of technical expertise may be lost very soon. Though I'm now in Jefferson City, my family is from St. Louis and St.

Charles areas, so this is a particular concern of mine to make the community right. Thank you.

DR. ZIEMER: Thank you very much, Jim, and I'm sure the NIOSH staff, as well as ORAU, will appreciate any input you have once you've completed your review of the document. And if you have additional recommendations, suggestions or documentation that would be of help to them, they'd appreciate it.

Now Richard Miller is the last one I have on the list. Richard.

MR. MILLER: Thank you, Dr. Ziemer. And I realize it's lunchtime and past, so I'll try to make this crisp and to the point.

First I would like to thank Russ for his presentation on the scientific research question, and I know a number of us are looking forward, once the energy and water probations bill process is completed -- Senator Bingaman* was -- wanted -- put $2 million aside for additional research on chronic lymphocytic leukemia in the energy and water bill in the Senate, and it's in conference. I think the conference is tonight. So pretty soon we'll find out whether that money will be

available, and we certainly hope that NIOSH, working with HERB, can come up with some answers on CLL, if the resources are there.

Secondly, I read that the Blockson Chemical site profile was on the web, and I was really quite surprised to see it posted so soon, and maybe someone can explain why it was posted until what is really a very significant unresolved question is addressed about Blockson? I don't know if anybody on the Board's had a chance to read it, but it excludes any discussion whatsoever of the radon exposures at the Blockson Chemical site which processed -- made phosphoric acid as a feed, which was then used for uranium extraction in a subsequent process. And although Blockson's not the only company that did this, certainly it's going to set the benchmark for whether or not these radon exposures and the effects on lung cancer will be considered or not. So once a site profile's been posted and you haven't even addressed what is a major, major, major source, I guess my basic question is is this site profile now going to be used for dose reconstruction without even addressing the radon

question? Is that right?

MR. ELLIOTT: It's available for use.

MR. MILLER: If it's available for use, it's going to be an invitation for a very significant set of unresolved questions that really need to be addressed. I can't imagine that something as significant as excluding a major source term would -- I can't imagine how NIOSH can go forward and leave this hole in the donut, so to speak.

DR. NETON: I'd just like to comment on that. The Blockson -- the Blockson Chemical site profile is out there. We didn't exclude the radon exposure. We've reserved it. We have not addressed that issue yet, and that is really tied up in the definition of the facility issue. And we do believe we have a technical basis that's solid for all exposures there, excluding radon. And to the extent we can move claims forward that may not be related to radon exposure, we will do that.

MR. MILLER: I just would offer that the Board should just be well aware that incomplete documents are now being posted as site profiles. I've sent an e-mail to

Larry, specifically on the definition of an atomic weapons employer, on this very issue related to Blockson. I've not heard back from NIOSH on it. I have tried to interact constructively at the staff level on this to try to work through if there is a legal definition issue or a policy issue to be clarified. And I'm going to -- you know, I'm a little disappointed. I've gotten no answer back and I've tried to open the discussion and now the site profile's posted and we still don't have an answer. So I think that's a disservice at this point and I wish you all had briefed it and advertised the incompleteness of that site profile to the Board so it's out in the light of day.

I realize you all are working hard on this, Jim, and -- but -- but, you know, message -- message delivered.

The second question has to do with really the site profile on the TBD here at Mallinckrodt. I went through it and I had a chance, mostly on the airplane out here and since I've been here, to read it. Particularly I appreciate the enormous number of documents that were reviewed and put into this. And I

was particularly interested to read the footnotes, and one of the footnotes that would be very helpful if it were made as a public document is a November, 1950 AEC memo, which forms the basis -- it appears from reading this document -- for the extrapolation of how you are going to estimate the dose for those for which there was not either internal or external dosimetry. This was I think done by Eisenbud. Eisenbud drafted a memo dated January 31st, 1951 in which he opens by saying (Reading) About a year ago you asked if it would be possible for us -- presuming that's Hanson -- to estimate our, quote, potential liability among the long-term Mallinckrodt employees. As I explained at that time, you presented a rather knotty problem, one which, in the state of our present knowledge, would probably not be answered, even to a first approximation. Stimulated by the question, they have since prepared the attached report, an estimate of cumulative multiple exposures to radioactive materials. This report gives, by extrapolation of the best available laboratory and human data, estimates of the doses to critical organs of all Mallinckrodt employees

during the period from '42 to '49. The report shows that there are 17 employees whose lungs have had more than 1,000 rem of exposure. I have purposely withheld distribution of this report for some two months in order to give us a little more time to consider the validity of our estimates.

And on he goes. I guess I would just suggest it would be very helpful if that document could be made available. I can't imagine that it's -- if it publishes -- UNCI (sic) or -- or -- or Privacy Act issues. But if it forms the very foundation for you assuming that no special cohort is warranted, the dissemination of that document is foundational, particularly when it was prepared by a liability adverse agency. And as we know, the insurance division of the AEC in many cases affected the quality of the science that was produced, and most notably at Paducah.

Secondly, you know, I think there was an earlier discussion today -- let me get to the extrapolation question. In a '75 Eisenbud report that was prepared, he -- he mentioned, amongst other things, that in the time periods where they didn't have good data, they

were nonetheless estimating in the early process that they had up to 200 times MAC, or maximum allowable concentration. I don't know what the -- I don't know what the methodology is that's going to be used for extrapolating, again, backwards. Is it going to be sort of the worst case -- sort of -- kind of a -- to use Jim Neton's words, capping the dose? Or are we going to just simply come up with some average and back-calculate, not knowing what the data is? And so the very foundation of that extrapolation, or if it -- I would even go so far as to say speculation or hypothesis of what the exposures could have been is very, very important because if claimants are denied because you don't have the data, and you wrap it in the flag of oh, we made claimant-friendly assumptions, but the basis of that is so speculative, it casts a question for those of us evaluating at least to know whether a special cohort petition is warranted. And it clearly states in the site profile -- in fact, it raises I think in here that -- almost a prejudgment of that question. It says on page 25 -- it says (Reading) Little individual monitoring data is available prior to

'46, and in truth, prior to '48 for the internals. Some extrapolation of existing data to cover the unmonitored periods is necessary, as AEC itself tried to do.

Well, if we're relying on AEC's work, as this memo reveals, with a liability averse perspective, we question the weight of the conclusions that were drawn there.

Finally, in terms of the question that came up about the credibility of data, Mont Mason was a very significant individual who worked as the head of the safety division for Mallinckrodt for many years, and then after he retired he did some consulting work. And in the course of his consulting work, he wrote a -- some very interesting documents that kind of reflected on his -- his work and the quality of the data he was involved with. And he had a lot of communications, which you've footnoted in the Technical Basis Document, with both Dr. Eisenbud, Blatz and others in the AEC. But what was remarkable was Mallinckrodt's view of their obligation. They had removed somewhere around 39 employees from work due to overexposure. They had

calculated their own index for what is a maximum lifetime tolerance for uranium exposure. But they didn't really want to say what the basis for that was. And in fact, it -- on -- on -- on -- as part of caution and advice of attorney, a formal report was never prepared to document -- that no document was prepared so that it could not be subpoenaed. And so what you have is a concern that only listed names with numbers and work sheets were prepared on the uptakes of these individuals. There was no lengthy description of the basis for calculations to be pulled apart by the scientific community with the possibility that such controversy would undermine employee confidence in the company safety measures. Our position was simply that Mallinckrodt had internal safety standards against which to measure exposure and had control points for preventive action.

Now I don't know what precisely AEC relied upon as their raw data, and I don't know precisely whether AEC's data was foundational upon the dust collection and urine samples that were done by Mallinckrodt, but I have to think that, although both were working

together, it casts some doubt on whether or not (Inaudible) get the basis for the scientific calculations upon which at least Mallinckrodt based their own analyses because of concern about liability again, whether we can in fairness rely on the conclusion that we heard from Jim Neton earlier today in response to a question from the Board that we can reconstruct that dose.

Now we may -- that may be possible. And maybe by capping the dose, maybe by using some of the other methods that NIOSH has talked about in its regulations, that's possible to do. But I think there's a cloud hanging over, based on the review of some of these historic documents by individuals with credibility who are close to the process. And I would really like to open up at some point, in another forum, a much more extensive discussion about the basis for this, quote, extrapolation. And if that basis isn't a good basis, then I don't know why it is that the conclusion has been drawn that it's feasible to estimate dose with sufficient accuracy. And I -- and I think a lot of people are going to start to ask that question. We

appreciate the candor of -- of NIOSH and the Technical Basis Document for saying where they don't have data. But the basis for the extrapolation, or as I would consider it, based on what I've read, speculation, really needs to be spelled out more clearly before anyone can draw some firm conclusions. And I would like you all to arrange to -- to provide some transparency in that area.

Finally, just a footnote, and I noticed that you footnoted the Mound dose reconstruction document, and I was pleased to see you did so because there they received many of the materials for refining that came from the Mallinckrodt site. They had an actinium refinery. They refined protactinium. They refined, of course, ionium, thorium 230. What we found is is that the risks from exposure don't seem well-characterized from the raffinate, outside of radium, that is, and radon. They don't seem well-characterized. And I don't know why the report doesn't delineate -- was it because they were in a liquid form and therefore there wasn't a chance of inhalation? Or was this due to something else? Was this due because it wasn't just

fully considered that this was a dry filter cake that generated -- you know, or that the process of making a filter case, you generated aerosols? But I think that there's probably some room for further inquiry there. And then lastly, there's no accident incident reports cited in the -- that I could find -- cited in the literature, but we know that there were uranium fires from the milling of the dingots (sic) and the derbies, as we had at all the uranium milling plants. And I would hope that those kinds of accident incident reports would find their way in as you move this document forward.

So thank you for your time.

DR. ZIEMER: Thank you very much, Richard, for your comments and your insights.

We need to have a lunch break. After lunch, we have a closed session of the Board for the purpose of developing, reviewing and discussing the independent government cost estimate for contracts for the Board. I need to announce that that is the only business that the Board will conduct this afternoon. There will be minutes kept of that session. Is there anything else

that I need to announce to the public on that session? A comment from Larry.

MR. ELLIOTT: I would just like to thank all of the workers who were here today. I appreciate your attendance and we really do appreciate your comments on the record. So thank you for coming. I know that perhaps it's an inconvenience, but we do appreciate your being here.

UNIDENTIFIED: (Inaudible)

MR. ELLIOTT: Thank you.

DR. ZIEMER: And let me reiterate that thanks on behalf of the Board to all who did participate, yesterday and today, in this particular session. We have your comments. We value them. And we're hopeful that that will help us do our job better, as well.

We're now recessed till -- give us -- let's take an hour, Board. See if you can get back here in an hour.

MR. PRESLEY: Can we leave our stuff in here?

DR. ZIEMER: Can we leave things here, Cori?

MS. HOMER: Yes.

DR. ZIEMER: Yes.

(Whereupon, the public meeting was adjourned and a

luncheon recess was taken by the Board, 12:45 p.m.)

C E R T I F I C A T E

STATE OF GEORGIA)
)
COUNTY OF FULTON)

I, STEVEN RAY GREEN, being a Certified Merit Court Reporter in and for the State of Georgia, do hereby certify that the foregoing transcript was reduced to typewriting by me personally or under my direct supervision, and is a true, complete, and correct transcript of the aforesaid proceedings reported by me.

I further certify that I am not related to, employed by, counsel to, or attorney for any parties, attorneys, or counsel involved herein; nor am I financially interested in this matter.

WITNESS MY HAND AND OFFICIAL SEAL this _____ day of November, 2003.

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STEVEN RAY GREEN, CVR-CM
GA CCR No. A-2102